# Industrial Psychology and Its Social Foundations

Under the Editorship of GARDNER MURPHY

REVISED EDITION

# Industrial Psychology and Its Social Foundations

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To DOUGLAS FRYER

## CONTENTS •

# LIST OF FIGURES •

# PREFACE TO THE REVISED EDITION •

SINCE 1949, when the first edition of this book appeared, progress and growth have taken place in the field of industrial psychology and also in the author. This revision represents the author's views of the extent of the change that has taken place. He has deliberately attempted not to disown the past and so no claim is made that this book is entirely different. However, the revision differs from the original in organization. It also includes content changes and these occur as a result of reference to more recent research in the field and extensions of point of view as a result of integrating the material.

The book has been organized into six parts, namely, "Prelude," "Understanding the Employee," "Understanding the Employer," "Problems Related to Work," "Product Distribution," and "Summary and Integration." The author views industrial psychology as paralleling the entire process of work from manufacture through distribution. A systematic presentation of industrial psychology must be inclusive and not merely be related to a part of the total business process. The promotion of more harmonious employer-employee relations in a democratic society demands that these relations have an extended democratic base, that the social aspects of these relations be understood and that the basis for mutual trust be rooted in statements of goals and the search for scientific knowledge. Fact must replace bias and hearsay distortions. Conclusions must be based upon data gathered in accordance with prescribed scientific methods. Hypotheses are acceptable as tentative explanations, but never as conclusions. Although much, if not all, of the material is controversial, the author has tried to present all points of view fairly. Nevertheless, he has been critical when he believes that this will help to get rid of the emotion that retards progress.

The book is intended as a systematic presentation of the subject matter of industrial psychology. It has neither employer or employee bias. It hopes to promote more harmonious relations through the extension of the democratic process in industry, through the increase of satisfaction

in work and providing the techniques to encourage the increase of productivity. Such aims must ultimately benefit all who work. The book has been written with two purposes in mind. The first is for use as a college text for such courses as industrial psychology, personnel psychology, business psychology, and applied psychology. It may also be useful as supplementary reading for courses in industrial engineering, labor relations, personnel, executive development, and the like.

Those concerned with business problems, such as executives, union leaders, owners of small businesses, or employees, should find this book helpful. It is hoped that parts of it will offer solutions or at least pave the way for a more broad understanding as to the nature of the problems.

The Prelude includes the first two chapters. Chapter 1 presents the industrial psychologist as he performs in industry. It comes to grips with such real problems as method, and resistance to change. The second chapter reviews the Hawthorne Studies and their implications.

The second part of the book includes five chapters. Chapter 3 emphasizes the social meaning of work. An effort is made to combine practical everyday knowledge with research studies leading to a better understanding of motivation and incentives operating in industry. Chapter 4 reviews the various methods of measuring attitudes and reminds the reader that such results must be put to use if they are to have real value. Chapter 5 considers job satisfaction as related to an individual's needs and raises the question: "Why assume that job satisfaction is a tool that necessarily increases production?"

Chapter 6 holds steadfastly to the view that morale is a group phenomenon. Chapter 7 concerns itself with the psychological aspects of unemployment, a phenomenon not clearly understandable to the "younger generation."

Part III includes two chapters. The effective leader on all levels of industry is to play an increasingly important role. Leadership and political atmosphere, and the views that leadership characteristics are behavioral and situational and thereby acquired, are stressed. The interaction of the leader and the group can furnish important clues to effective leadership. Industrial warfare has been included in this section because more effective leadership can reduce strife. Research as a tool to seek the causes of grievances and industrial peace is emphasized. Part IV includes eight chapters, and each refers to a task of the industrial psychologist as he seeks to make the industrial economy more efficient. Chapters 10 and 11 are concerned with psychological tests. Tests can be

useful aids in selecting employees, provided the limitations of the tests are clearly understood. A major problem in testing is related to the use of tests as predictors or describers, and reference is made to the fact that tests may vary in effectiveness. Models are suggested. Chapter 12 treats job analysis and evaluation. It emphasizes the importance of evaluating such systems. Training the raters not only in rating but also in communicating the results is necessary.

Chapter 13 considers the influence of the work environment on production. Many exaggerated claims in this field have been the result of the optimistic beliefs held by those responsible for promoting the beliefs. The need to examine the data and the experiment is considered necessary before the panaceas are acceptable. Chapter 14 does not consider fatigue and monotony as leading to important solutions in the field of work. Rather, the relation existing between the actual and nominal hours of the work week and the confusion caused by misunderstanding this relationship are emphasized. Absenteeism is regarded as a symptom of many different causes, and recognition is given to the view that its degree may be present in an inverse relation to the quality of supervision. Chapter 15 recognizes the resistance of the worker to time and motion studies. It points out the scientific limitations of such studies. Human engineering, the psychologist's concern for integrating man-machine systems, considers machine design in terms of human abilities and limitations. It is the psychologist's application of time and motion studies.

In Chapter 16, the principles of learning and the various training methods are presented. Emphasis is placed on the need for research in evaluating industrial training. Deëmphasizing accident-proneness as a factor in understanding accident causes is recommended in Chapter 17. A positive program for reducing accidents is presented and emphasis is placed upon the havoc caused by the automobile and the driver.

Part V includes three chapters on the distribution aspect of business. The value of behavioral as well as attitudinal studies of consumer reaction is presented in Chapter 18. This chapter also suggests the advisability of integrating economics and psychology via the medium of consumer investigations. Chapter 19 presents the role of the psychologist in the field of advertising. He is, once again, the researcher rather than the know-it-all. Motivation research and media research are discussed.

Chapter 20 points to the paucity of the psychology of selling. Tests to select salesmen are rarely subjected to cross-validation studies and this is a shortcoming. Part VI is Chapter 21. It represents an effort to sum-

marize and integrate some of the author's views as presented. It also points up the major problem of the industrial psychologist—the quest for criteria. It may be read as a preview. Under these circumstances it will be somewhat difficult and debatable. At least it will give the reader a thumbnail sketch of the author's views. It should be read after the text has been digested. It can then be a hasty review of the subject matter.

Although the chapter order now appears logical to the author, it is immediately conceded that various chapters could have preceded or followed other chapters. The book has been written so that any chapter can be read separately or in a different order.

### Acknowledgments

Students and clients highly deserve recognition as contributors to the thoughts expressed. The challenging questions on the parts of students have resulted in the development of hypothesis and theory.

Client companies have presented the opportunity to test for practicality as well as to obtain invaluable data.

The members of the psychology department at the Baruch School of Business of the City College of New York have been most helpful in many ways.

The many authors and publishers quoted have been most kind in the generous permissions.

Dr. Gardner Murphy continues to be a source of inspiration. I count it a distinct privilege to write under his editorship.

A special debt of gratitude is owed to three persons who have made this revision possible. Miss Ruth Tepper has offered most conscientious secretarial assistance. Mr. Angelo Dispenzieri has carefully read the manuscript and has served as a sounding board in a most resonant manner. My wife has provided motives and incentives and as honest critic pushed this book through to completion.

*September,* 1955 MILTON L. BLUM

# PART I • 

# • Prelude

**WHETHER** the reader of this book is a college student or a businessman, the author wishes to make a determined stand to come to grips with him at the earliest possible moment.

Too often a person begins the study of a subject with a preconceived notion of what it should contain and is disappointed because a difference exists between it and reality. Sometimes he loses his potential interest in the subject because the objectives and the content are not clearly identified at the very beginning. Accordingly, two chapters comprise Part I. The first introduces the industrial psychologist and the second reports a comprehensive industrial experiment to give a panoramic view of a considerable part of the subject matter. These chapters are intended to define objectives, prescribe the content, and make clear that industrial psychology is the application of scientific methodology to the business scene.

CHAPTER 1

# Introduction

**INDUSTRIAL** psychology must boldly ask the question whether the ultimate in efficiency is maximum production of the moment. It may well be that production as the measure of ultimate efficiency is a naïve concept. Maximum production may be achieved as a short-term goal but may lead to conflict and lesser production in the long run. Under a system of force of cajolery, production may meet a specified goal. But for how long?

Force and the prevention of free expression can eventually lead to aggression and revolt. Similarly a "phony" system in which objectives and goals have been misrepresented is eventually discovered. When people discover that they have been fooled they resent the situation and may even become scornful.

Industrial psychology must be aware that employers and employees have short- and long-term objectives, and further, that these objectives differ and may conflict. It must ferret out the variety of circumstances that most accurately allows for the description and prediction of human behavior in the work situation. It must use the scientific method. It must formulate hypotheses and distinguish between hypothesis and fact. It must differentiate between conclusions based upon fact and conclusions based upon wish fulfillment. It must recognize that human relations in industry, as elsewhere, are a complex phenomenon and that the search for the simple single rule to explain all and everything will be as fruitless as the alchemists' efforts or the physiognomists' pursuits.

Industrial psychology offers a dynamic solution to the perplexing problems which confront our industrial society and economic system. It is a means of encouraging and promoting democracy in industry and thereby enhancing the satisfactions of the employers and the employed. It promotes greater efficiency, but this is a secondary consideration. Efficiency has been overemphasized and often regarded as the sole objective of in-

dustrial psychology. Various efficiency systems under the guise of "scientific" management have been proposed and have been effective from time to time in bringing about temporary increases in production, but practically all have overlooked the tremendous importance of the worker as an integrated social human being.

If industrial psychology is to be distinguishable from "scientific" management and other systems which may border on its field, it must boldly expound the view that democratic principles must be applied to industry. Its goal should be the satisfaction of man, not of any one man to the disadvantage of others, or of one group over any other. Men must be free to express their feelings, to reach goals, produce, and develop as secure individuals. These and other freedoms are possible in a democracy and are also possible in an industrial system operating in a democratic fashion. Efficiency then follows as a necessary accompaniment.

### Definition of Industrial Psychology

Psychology studies the behavior of man with the aid of scientific methodology. It uses the experimental method—that is, observation under controlled conditions—to gather data. It also uses other methods to obtain facts, such as the case history method and observation of development as it takes place. Psychology accepts introspection—or a subject's report that describes mental processes—as a source of data. It is interested in obtaining facts which can be readily verified and duplicated.

The term "psychology" is not synonymous with "common sense." Often when "common sense" is applied, the conclusions drawn are incorrect because of either insufficient information or a confusion of cause and effect.

Another term used incorrectly in connection with psychology is "human nature." People often attempt to explain behavior by attributing it to "human nature." This is merely a verbalism; it does not explain the behavior. Sometimes the term implies that people act in a certain way because of inherited predispositions. The assumption of an inherited predisposition without valid proof does not stand up in the science of psychology.

Industrial psychology draws upon the facts, generalizations, and principles of psychology. It uses the method prescribed in the parent body. Because it applies the techniques of psychology to the industrial scene and the problems confronting it, industrial psychology formulates and modifies procedures to meet the conditions found in business rather than in the laboratory.

Industrial psychology is simply the application or extension of psychological facts and principles to the problems concerning human relations in business and industry.

The most important aspect of industrial psychology is its discipline. It clearly recognizes that scientific conclusions must be objective and based upon facts gathered as a result of a defined procedure. It does not treat assumptions or hypotheses as if they were conclusions. Its findings sometimes confirm the obvious and very often are not romantic. Whereas chemists are no longer confused with alchemists, and psychologists are differentiated from physiognomists, the same clear-cut differentiation does not apply to industrial psychologists in relation to their "gold-brick" salesmen brethren who sell the impossible with all the authority of ignorance.

The misinformed often believe that all that is necessary to have a knowledge of psychology is to be a human being who has common sense and to be a student of human nature. A psychologist is quite a different person. He is one who has professional training, is aware of the limitations of his knowledge, and primarily has been indoctrinated in a methodology to obtain conclusions based upon data acquired according to certain prescribed scientific methods.

## The Industrial Psychologist

The industrial psychologist may be employed by a company. He may be a consultant to a trade association, to retailers or manufacturers. He may also be a professor at a university who does research in the field either privately as a consultant or as an associate in the university institute. In the future he may be on the staff of a labor union. Regardless of the field in which he works, the industrial psychologist must report research findings accurately. Hence the need for an unbiased approach is great if he is to make his full contribution to society.

Although industrial psychologists have been employed predominantly by large companies, this does not mean that small business organizations cannot benefit from the correct application of the principles and generalizations of industrial psychology. As more students of psychology become interested in the industrial field and as more small businessmen are made aware of the benefits of industrial psychology, greater advantages will accrue to our society. Small and large business organizations have similar problems and therefore the findings are likely to be applicable to both.

Since most states do not license industrial psychologists—or psychologists, for that matter—the question arises as to how one becomes an ac-

credited industrial psychologist. Legitimate recognition occurs primarily along educational and professional lines. The American Psychological Association is the professional body of psychologists; similar associations exist among dentists, doctors, sociologists, etc. It has three classes of membership. The associate is a person who meets such minimum standards as either two years of graduate work in psychology at a recognized graduate school or one year of study and one year of professional work in psychology. At the time of application the candidate must be devoting full time to either graduate or professional work. Fellows represent a higher status of membership; they have the Ph.D. degree and five years of acceptable professional experience subsequent to the granting of the degree. Life membership, not likely to be of immediate concern to students, is reserved for members of twenty years' standing who have reached sixty-five years of age.

Table 1.1. Fields of Employment of Psychologists

| Field | Number of Employees |
|---|---|
| Academic—teaching and research | 6000 |
| Federal government (including research, military, and clinicians in hospitals and agencies) | 1850 |
| State and city government schools, clinics, and agencies | 1850 |
| Private industry | 600 |
| Private clinical practice | 300 |
| Graduate students | 450 |

One of the divisions of the American Psychological Association is Division 14, known as the Division of Industrial and Business Psychology. It has two classes of membership which require similar standards as membership in the APA except that the experience requirement is related to industrial experience as a psychologist. In 1955 this division had approximately 500 members whereas the entire APA had about 13,000 members.

A further degree of attainment is the award of the diploma, which is a certification of specialty. This diploma is awarded by the American Board of Examiners in Professional Psychology. Certification procedures have been set up in clinical, counseling and guidance, and industrial psychology. Standards for diplomate status are the Ph.D., five years of qualifying experience, and the passing of two days of written examinations in the specialized field plus an oral if the written part is passed. In 1955 there were about 1200 diplomates of whom 159 held the diploma in industrial psychology.

Although it is exceedingly difficult to obtain complete figures it has been estimated that approximately 600 psychologists are employed on a full-time basis in industry (*18*). Table 1.1 presents the analysis of the fields of employment of psychologists. From Table 1.1 one can readily ascertain that psychologists are employed full time in private industry or clinical practice to an extremely limited extent and that both fields repre-

Table 1.2. Analysis of Most Important Work Functions, by Groups (*4*)

| | |
|---|---|
| A. Business and industry group (N 56) | |
| Duties involving: | |
| Personnel functions | 33% |
| Scientific, research and development functions | 25% |
| Policy and management functions | 20% |
| Labor relations functions | 12% |
| Education and training functions | 5% |
| No response | 5% |
| | 100% |
| B. Consulting group (N 37) | |
| Duties involving: | |
| Personnel functions | 25% |
| Policy and management functions | 24% |
| General consulting functions | 21% |
| Research and development functions | 11% |
| Clinical functions | 10% |
| Labor relations functions | 3% |
| Market research functions | 3% |
| No response | 3% |
| | 100% |
| C. Advertising group (N 10) | |
| Duties involving: | |
| Market research functions | 70% |
| Policy and management functions | 30% |
| | 100% |

sent tremendous opportunities for expansion and growth. However, many psychologists whose major occupation is academic teaching are also consultants to industry, clinicians, and therapists.

Cantor (*4*) analyzed the results of a questionnaire returned by 56 respondents in business and industry, 37 consultants, and 10 psychologists in the field of advertising. The results indicated that employers were

generally large corporations but that consultants' clients were both large and small companies. The psychologists in advertising were generally employed by advertising agencies. Table 1.2 presents an analysis of most important work functions of the respondents.

Personnel, research, and management functions provide the greatest work role for psychologists in industry. Labor relations and training are fields of importance but psychologists are not involved in them to the extent expected or desirable.

Although a schism between the staff psychologist and the consultant is undesirable if the profession is to be advanced in industry the answers to the question "What do you think of consulting firms as the best solution to industrial psychological problems?" pose a serious future problem. One-half of the staff psychologist group was unfavorable toward them while the consulting group was generally favorable. This situation demands attention and should be cleared up. A note of optimism is reflected toward the field in general since 80 percent of the respondents reported that executives were becoming more "psychological minded."

### The Consultant and the Staff Psychologist

The industrial psychologist is likely to obtain his livelihood through one of three major sources of employment. He is either a consultant, an employee of a company, or a teacher at a university. Very often he combines two of the three roles but whether he does or not depends upon his interests, opportunities, degree of identification, and tempo.

Generally speaking, the duties and tasks of the consultant and the staff psychologist overlap. There is no clear-cut difference in so far as type of assignment is concerned. The major difference is that the consultant may be concurrently working for a number of clients or employers whereas the staff psychologist fills a more specific role in the organization chart and for one employer.

### Scope of the Industrial Psychologist's Work

The psychologist employed in industry has a varied job and varied titles. His main function is to render service to the employer, to the employee, and to the various technical specialists in the organization.

Taft (*19*) discusses some of the industrial functions for which the psychologist is qualified. Included are job analysis; motion studies; salaries and wages; selection of new employees; transfers, promotions, and terminations; training; problem employees; employee rating; industrial hy-

giene; morale; and research. The psychologist employed by an industrial organization is likely to find that he is required to attack any one of these problems at any time.

Table 1.3. Business and Industrial Organizations Employing Diplomates in Industrial Psychology

| Firm Name | Title |
|---|---|
| American Home Products Corp. | Director of Personnel |
| Atlantic Refining Co. | Research Assistant |
| B. F. Goodrich Co. | Coördinator of Training |
| Carbide & Carbon Chemical Co. | Asst. Director, General Industrial Selection Department |
| Chrysler Corp. | Educational Supervisor |
| Columbia Broadcasting System, Inc. | President |
| Commonwealth Life Insurance Co. | Director of Research |
| Continental Oil Co. | Director of Advertising |
| D. E. McNicol Pottery Co. | Vice-President and General Manager |
| Detroit Edison Co. | Industrial Psychologist |
| E. I. du Pont de Nemours & Co. | Manager, Personnel Research Section, Pres. Div. |
| Fieldcrest Mills | Department of Personnel Research & Training |
| General Motors Corp. | Chairman, Personnel Evaluation Services |
| General Shoe Corp. | Director Supervisory Training |
| Gulf Oil Co. | Head, Training Unit |
| Harwood Manufacturing Co. | President |
| International Business Machine Corp. | Coördinator, Educational Research |
| Knox Reeves Advertising, Inc. | Vice-President, Marketing Director |
| Life Insurance Agency Management Association | Research Associate |
| Marshall Field Co. | Vice-President |
| Needham, Louis and Brorby | Vice-President |
| Procter & Gamble | Head, Research Department |
| Prudential Insurance Co. | Asst. General Manager, Director of Personnel Research |
| S. C. Johnson & Son, Inc. | Personnel Director |
| Standard Oil Co. | Advisor, Employee Relations Research |
| United States Steel Corp. | Manager, Personnel Development |
| Wm. Esty Co. | Executive Vice-President |

An example of the varied nature of the work is given in an article by Bills (2), describing a typical workday of an industrial psychologist. The day started with a conference at 9 A.M. which was called as a result of an interview held the preceding afternoon. The conference was to decide on the placement of an employee for a two-month period. This employee had been diagnosed as mentally ill and the company was attempting

therapy by a psychiatrist rather than resorting to immediate dismissal. The second problem for the psychologist was an attempt to predict whether a person's ability to punch Hollerith cards could be ascertained in three weeks. The next problem concerned the transfer of two employees to fill two vacancies. Problems concerning salary levels and rating scales occupied the remaining portion of the morning. Immediately after lunch the psychologist had to meet with the Employee's Loan Fund Committee; the particular problem facing them had arisen as a result of a misapplication of some funds. The psychologist next talked with a cleaning woman who felt that the supervisor was not giving her a fair deal. Another employee who had been married for six months asked the psychologist for advice on how to inform her disapproving parents.

Actual test development and research thus played only a small role in this particular day's work. The psychologist who is on the staff of an organization is likely to find that the specific minor problems which arise each day may interfere with his major work. He must therefore be flexible and prepared to handle a number of tasks and projects concurrently. As has been stated, the duties of an industrial psychologist and the title assigned to him are likely to vary. Table 1.3 lists some firms that employ diplomates in industrial psychology and their titles.

Firms selected for inclusion in this table are merely representative. The table is intended to give an idea of the range of titles and not be a complete listing of companies employing psychologists.

In addition to the diplomates employed in industry, psychologists work for many other companies, including the following. Again no attempt is made to furnish a complete list but rather to give an idea of the wide range of companies employing psychologists.

Aetna Life Insurance Co.
American Can Co.
American Viscose Corp.
Armco Steel Corp.
Caterpillar Tractor Co.
Continental Can Co.
Corning Glass Works
Creole Petroleum Corp.
Esso Standard Oil
Ford Motor Co.
General Motors Corp.
International Harvester Co.
Kimberly-Clark Corp.
Eli Lilly & Co.
McCann-Erickson, Inc.
Metropolitan Life Insurance Co.
Midland Coöperative Wholesale
Minneapolis-Honeywell Regulator Co.
Minnesota Mining & Manufacturing Co.
Pittsburgh Plate Glass Co.
Rand Corp.
RCA: Victor Division
The Chesapeake & Ohio Railway Co.
The Dayton Co.
The Prudential Insurance Co. of America
Washington Gas Light Co.
Young & Rubicam

Table 1.3 reveals that few industrial psychologists are assigned the title of the profession. The clear picture is that the psychologist is assigned a title related to his function or job duty. Industrial psychologists are also employed in government work especially related to research, and development in the armed forces. Psychologists are also employed in certain nonprofit organizations whose work is primarily related to industry. Three examples are the Committee on Highway Safety Research, the National Industrial Conference Board, and the W. E. Upjohn Institute.

### Consulting Organizations

A psychologist, in addition to being directly employed by a business organization, is also found in many consulting organizations. Consulting on problems of a psychological nature is "big business." The oldest and largest organization of this type is the Psychological Corporation, which was organized in 1921 by a group of psychologists. The 1953 annual report (*16*) shows the rather steady rise in volume of this consulting company as reported in Figure 1.1.

The Psychological Corporation is organized into the following divisions: Marketing and Social Research Division; Test Division; Industrial Division; Professional Examinations Division; and Psychological Service Center.

The Marketing and Social Research Division does consumer research studies and publishes its *Psychological Barometer*, a study of consumer purchases of specific products. It also does audits of public opinion and attitudes. The Test Division sells psychological tests that it publishes to schools, government agencies, and industrial firms. The Industrial Division installs testing programs for companies, improves training programs for management personnel, and trains supervisors in various techniques and principles in human relations. The Professional Examinations Division has by now evaluated more than 150,000 applicants to nursing schools and more recently has tested candidates for admission to colleges of veterinary medicine. The Psychological Service Center provides an individualized service in the fields of educational and vocational testing.

The Psychological Corporation employs about 25 psychologists, of whom about two-thirds have the Ph.D. and the rest the M.A. degree.

Richardson, Bellows, Henry and Company, Inc., was organized shortly after World War II. Its major office is in New York City but it has branch offices in Philadelphia and New Orleans. The major areas of work of this company include employee attitude measurement, executive appraisal,

the development and improvement of training programs and manuals for client companies, and research in test development and employee evaluation. This company also does consumer studies related to motivation research. The president and four of the five vice-presidents have the Ph.D. in psychology.
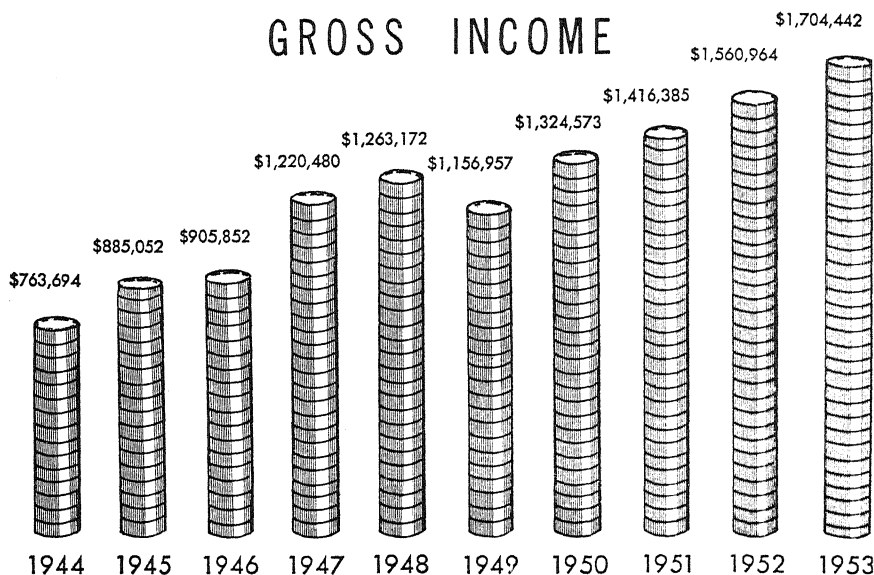
*Figure 1.1.* Gross Revenues of the Psychological Corporation. (From the *Thirty-Second Annual Report of the Psychological Corporation,* 1953.)

Dunlap and Associates in its 1953 report listed 24 officers and senior associates of whom 14 possessed the Ph.D. and all others but three held the M.A. (*6*). This company was organized in 1948 and specializes primarily in human engineering. Based upon experiment, data are acquired to recommend the optimum design to satisfy human performance requirements and area preferences. The company also does work in the field of executive evaluation and other areas usually handled by industrial psychologists.

Rohrer, Hibler and Replogle have offices in six cities and primarily provide psychological services to business leaders. Their approach is to first obtain a psychological evaluation of the executive and then conduct a series of individual conferences with him designed to change his behavior into more desirable patterns of action (*7*). This company was founded in 1927 and has five senior partners all of whom have the Ph.D. Their point of view in evaluation recognizes the importance of the clini-

cal as well as the psychometric diagnosis. Their relations with a company client are planned for a continuing series of visits since behavioral changes do not occur overnight.

### Research Centers at Universities

The practical aspect of solving problems by using research techniques was intensely demonstrated during World War II. The armed forces did not have the personnel or the unlimited facilities to do all the work that was needed. For compelling social reasons, universities did have to continue to grind out answers contributing to the extension of knowledge. Accordingly, many universities established research centers to handle problems related to industrial psychology. This situation has continued, and now there are many such centers handling on a contract basis research needed by many government agencies.

Although research in personnel problems and human engineering is of primary interest for our subject matter, additional work is done in the fields of physiological psychology, social psychology, and in such topics of general psychology as learning, retention, and the higher processes.

Research contracts are awarded by the Departments of the Army, Navy, Air Force, and such other branches of the government as the Atomic Energy Commission, the Department of the Interior, and the Veterans' Administration.

Specific problems related to job analyses and specifications; selection, classification, and criteria research; training; psychometrics; and human engineering are solved by contract research. Examples of nonsecurity classified contracts are as follows: billet analyses for guided missiles personnel; a study of the relationships between Navy billets and civilian occupations; submarine personnel selection; research on supervisory selection; radar mechanics functional knowledge test battery; effectiveness in technical training; speed factors in tests and in criteria; causation of accidents; the worker as a factor in equipment design; display and signal pattern discrimination; and attention value of warning signals. There are many many others.

Possibly the largest research center is at the University of Michigan. It is known as the Institute for Social Research and has two main divisions, the Survey Research Center and the Research Center for Group Dynamics. Although the staff of highly competent professionals are primarily concerned with social psychology, their work clearly shows the intimate interrelationship of social and industrial psychology.

The Survey Center is more concerned with problem-oriented than with discipline-oriented research. This means it promotes interdisciplinary research and combines the efforts of psychologists, economists, anthropologists, sociologists, and political scientists. Its research undertakings are sponsored by government agencies, private business, and research foundations. An example of one of its major concerns has been its work in the field of psychological economics or on consumers' economic attitudes.

The Research Center for Group Dynamics is primarily concerned with the phenomena of group behavior and an attempt to derive the principles of group dynamics leading to group formation, change, or dissolution. It has worked in the areas of group productivity, communication, and inter-group relations.

These two centers together with the parent body employ over 300 full- and part-time personnel. The organization chart of the Institute depicts the wide range of its activities and is presented as Figure 1.2. The Institute has published well over 250 articles, reports, and books as a result of its research activities (*12*).

The American Institute for Research was started in 1946 as a nonprofit agency. Although it operates independently its organization and program are tied in with the University of Pittsburgh. It has been mainly concerned with the development of the "critical requirements technique" or the collection of critical incidents. A critical incident is a description of things people do which are especially effective or ineffective in accomplishing specific tasks. This group is also doing work in the test development field as well as developing procedures for evaluating proficiency. Although most of their contract work has been for the Air Force, some work has been done under industrial auspices.

The Industrial Relations Center of the University of Minnesota is concerned with carrying on a program of training and research to improve the relations of labor and management and facilitate their coöperation. It recognizes that such work cannot be solely the province of any one department and actually draws from eight different departments, one of which is psychology.

The Institute of Industrial Relations of the University of California has two divisions, one at Berkeley and the other at Los Angeles. It pursues three major lines of endeavor—research, instruction, and community relations—and runs many conferences and lecture series as well as resident institutes for labor and for management. It too accepts the importance of the interdisciplinary approach.
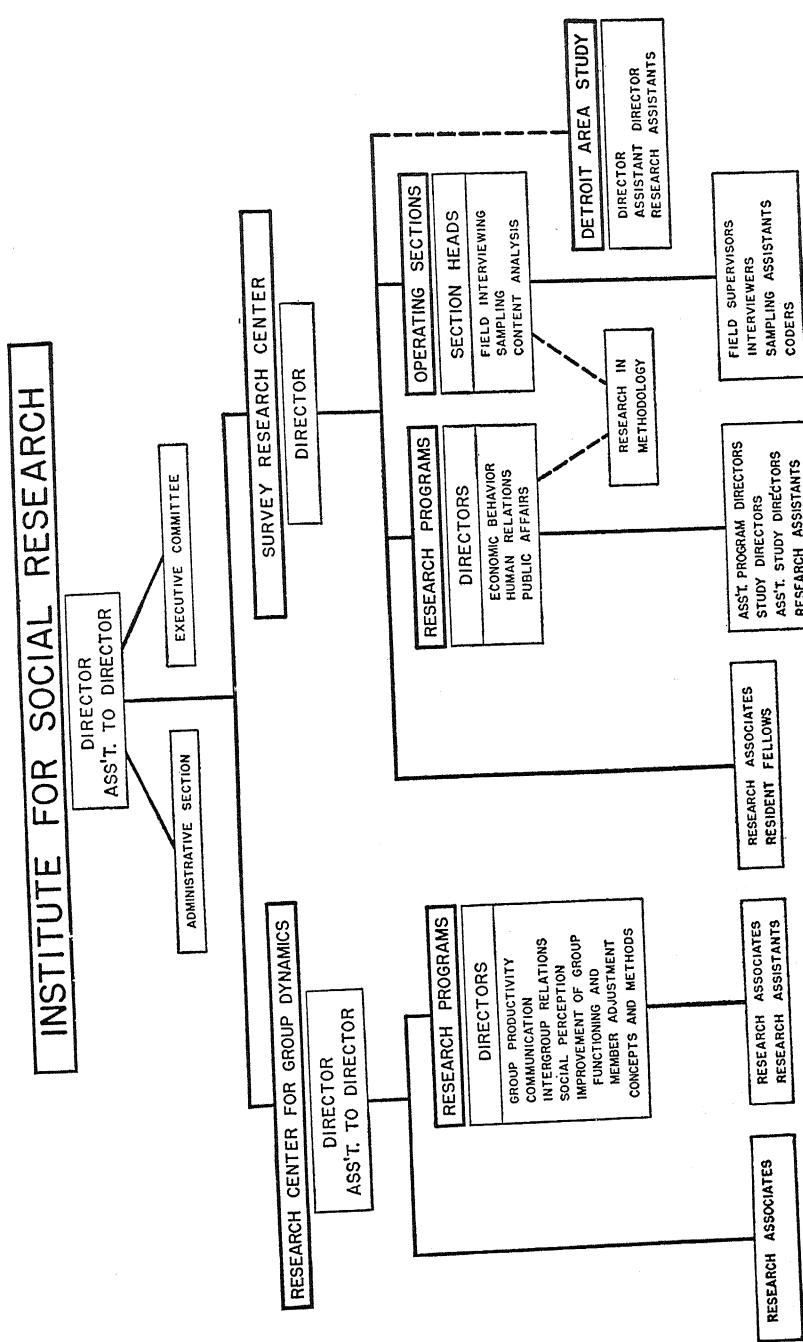
*Figure 1.2.* Institute for Social Research. (From the *1952 Annual Report of the Institute for Social Research,* University of Michigan.)

### Nonprofit Organizations Sponsored by Industry

Another type of research and consulting organization is sponsored by industry. The Life Insurance Management Association had its inception in 1922. It now has over 200 member companies and is organized into such divisions as company relations, research, actuarial, institutional relations, and administrative. The research division is concerned with the problem of selection, evaluation, and training of personnel.

The National Industrial Conference Board was founded in 1916 as an independent and nonprofit institution for business fact-finding through research. It is supported by more than 3000 subscribing associates from business organizations, trade associations, labor unions, libraries, and colleges. The research program is carried on by four major divisions. The Division of Personnel Administration is of greatest interest to the industrial psychologist. "Appraisal of Job Performance" and "Communicating with Employees" (*8*, *9*) are the titles of two of its many reports. These reports are meaty and serve as useful guides to those who want to learn from case studies as well as have a manual type of reference.

The organizations mentioned do not exhaust the list of consulting organizations, centers at universities, or coöperative research centers supported by industry. They have been selected merely as examples but of course all pass the rigid test of authenticity and compliance with stated purpose. Others too numerous to mention also meet such standards.

Examples have been cited to impress the reader with the realness of research. Each organization has been described all too briefly but the bibliographic references can furnish the necessary additional facts.

### History and Development of the Field

It is exceedingly difficult to apply a date to the founding of any body of knowledge. However, if one must indicate a date which could be called the "birth" of industrial psychology, the most reasonable one is probably 1913, the year in which Hugo Münsterberg's *Psychology and Industrial Efficiency* (*14*) was published. This book was the first to be written by a psychologist in the field. The differences of approach between the pure and the applied science are reflected in the author's first few chapters. Münsterberg writes cautiously and in a defensive manner of his attempts to establish an applied field of psychology as a necessary counterpart of the pure field. At the present time the applied psychologist does not have to be so concerned with these problems. Münsterberg's book, which has

served as a model for the development of industrial psychology, includes such topics as learning, adjustment to physical conditions, economy of movement, monotony, fatigue, and buying and selling. After the outbreak of World War I American psychologists in the applied field made many contributions; the growth of group testing, trade testing, rating scales, and the personality inventory can definitely be traced to their work toward the war effort.

In 1917 the *Journal of Applied Psychology* made its appearance; the importance of this periodical in the expansion of the field will be seen in the number of references throughout this book to articles which have appeared in it. At about this time, colleges began to introduce courses in applied psychology; and as the subject has developed, the trend has been to offer courses in specific fields of applied psychology such as industrial psychology, personnel psychology, and vocational psychology.

*Personnel Psychology,* a journal of applied research, first appeared in 1948 (*20*). It publishes the results of factual psychological studies in such fields as training, job analysis, selection, evaluation, motivation and morale, work conditions, and equipment design. Its articles are intended to be understandable to interested and informed management and yet meet at the same time the technician's requirement of accurate and complete reporting. This is an important point.

One of the shortcomings of industrial psychology is that its language and techniques sometimes become so involved that the outsider is really left out. If industrial psychology is to gain its important place in industry, psychologists must learn to talk and write in a fashion that is clearly understandable to others who are equally interested in the mutual problems and sometimes have an even greater stake in a solution.

In the writer's opinion, the most significant piece of research in the field is the Hawthorne Studies, to which an entire chapter in this book will be devoted. These studies were started prior to the depression of the early thirties. The depression itself had a considerable effect on the development of industrial psychology. While it may have slowed growth in some directions, it nevertheless opened many additional areas for survey. After the depression the importance of employee attitudes began to be recognized; consequently the greatest development in recent years has been in this area. World War II emphasized once again the tremendous importance of psychology in industry and out of it emerged recognition of the significant place of human engineering.

A valuable contribution in giving perspective in the development of

the field appears in the *Annual Review of Psychology*. Volume 6 appeared in 1955. This publication has specialists write chapters on each of the important branches of psychology, and of course each year a chapter is prepared which reviews the major articles and publications in industrial psychology.

Wallace and Weitz in reviewing the publications of the preceding year are concerned with the lack of integration, evaluation, and systematization of the field (*25*). They believe more concern should be given to methodological development and refinement. The major categories in their review are: criteria; job satisfaction and morale; training; equipment design; job analysis and evaluation; and selection.

Heron's review the previous year listed the following major divisions: European work; job evaluation and work measurement; vocational guidance; selection and placement; criteria; supervision; attitudes and morale; leadership and management; and indications (*11*). Harrell, in his review in 1953, saw the major divisions to be: general; individual differences; human engineering; human relations; and market research, advertising, and selling (*10*). As one further example, Brown and Ghiselli also did a review and their organization included such topics as: interview; selection and placement tests; job analysis and evaluation; criteria; training, motivation, and morale; group selection; human engineering; and accidents (*3*).

The outlines of Wallace and Weitz, Heron, Harrell, and Brown and Ghiselli are cited with two purposes in mind. First, they are intended to show the diversity of topics included in industrial psychology. Second, they indicate that the organization of the subject matter correctly rests with the perceptions of the particular author. Industrial psychology offers all who perceive it a series of methodologies calculated to obtain the truth via research. It is an ever increasing body of knowledge rather than a stagnant rehash of artifacts. In other words, we are not as critical as Wallace and Weitz. We recognize that the field is still emerging and that practicalities sometimes force application before the attainment of refined methodology and perfected validation.

Each of the chapters in this book will discuss one segment of the various duties of the industrial psychologist. The organization can well be criticized for chapter order and for the inclusion and exclusion of certain topics. The material is presented according to the way the author perceives his subject. It will be well to remember that each chapter is related closely to all the other chapters and that chapter divisions are merely

educationally desirable tools; they are not the realities. The individual in a work situation, be he employer or employee, has attitudes, satisfactions, motives, learnings; many varieties of feelings and knowledge impinge all at the same time.

### The Major Problem Confronting Research and Researchers in Industry

The findings of research as well as the process itself can ordinarily be expected to meet with resistance on the part of employees and in many instances employers. The successful practitioner of industrial psychology must be immediately and forever aware of this phenomenon. It would be purely academic if one anticipated that industry is waiting with open arms to have the knowledge of industrial psychology applied.

Attempts at change, no matter how well intentioned, produce threats and will be resisted. This resistance even takes the form of hostility and aggression against the change itself or the administrator of the projected change. Often the employee imagines the nature of the change well in advance of even the possibility of a change. The unreality of the imagination only makes the resistance stronger. When changes are associated with speed-ups or layoffs the future resistance to any contemplated change is more intense. It is not enough to state that no detrimental action to the employee's welfare is contemplated. The claim must be proved.

Anything that is not clearly understood can be an insecurity-producing factor. Change often upsets the momentum of inertia, which requires an effort to overcome. People are not easily corrected nor are they able to freely give up habits. Research often intends to accomplish changes in behavior that has become routine and so they can be expected to be resisted.

Resistance is applied not only by the employee but by all levels of management and the employer. The naïve employer often wants research to prove his point or position. Such guarantees are not possible since the conclusions of research depend upon the data and cannot be established by manipulation of the data to conform to a preëstablished outcome.

All, however, is not hopeless provided at least four fundamentals are recognized. First, the reasons for the contemplated change should be clearly explained. Second, those who will be involved in the change should have ample opportunity for participation. Third, change should be a two-way affair and not only an attempt to get all to agree to a one-sided decision. Fourth, the administrator of the change should recognize at all

times that he is a real, imagined, or potential threat and that he must do all he can to eliminate or reduce the possible threat regardless of the form it assumes.

### Summary

Industrial psychology enhances the satisfactions of employees and employers and secondarily promotes efficiency. It is intimately involved in the application of democratic principles to industry and raises such pointed questions as whether increased production in the short run means maximum production in the long run. It is dedicated to the application of scientific methodology as a means of solving the problems confronting man in his work situation.

The industrial psychologist is employed on the staff of companies, as a consultant, or as a professor, and for the present he is mainly involved in personnel, research, or management functions. His title is rarely psychologist but is usually related to his job function. Companies employing industrial psychologists were cited in this chapter and examples of the larger consulting companies and their work were described. Mention was also made of the research centers at universities as well as the nonprofit, coöperative research organization working for industry.

The major problem confronting researchers is resistance to change.

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CHAPTER 2

# The Hawthorne Studies

THE Hawthorne Studies are referred to because of their scope, significance, inclusiveness, and design. They form an interesting model. Although these experiments were conducted years ago, the passage of time has allowed them to take on the flavor of a classic. In the author's opinion they represent the most significant research program undertaken to show the enormous complexity of the problem of production in its relation to efficiency. Just as Hugo Münsterberg in his *Psychology and Industrial Efficiency* set the stage in 1913 for the work of psychologists in industry, so the Hawthorne Studies, carried on over a period of twelve years at the Hawthorne Works of the Western Electric Company, can be considered as "starting the show." They were begun in 1927.

In order to understand how these studies could pass from one type of experiment to another without the forced conclusions and forced pace of so many studies in this field, we need only quote Elton Mayo, professor of industrial research at Harvard and guiding star of the Hawthorne Studies.

> Researches of this type are usually impossible because of a foolish convention that institutions engaging in industrial research are expected to "pay their way" or "earn their keep." This means, in effect, that any such institution, living from hand to mouth, is committed to the futility of endless repetition of some former discovery. The interesting *aperçu,* the long chance, may not be followed: both alike must be denied in order that the group may "land another job." This confusion of research with commercial huckstering can never prosper: the only effect is to disgust the intelligent youngster who is thus forced to abandon the quest for human enlightenment.[1]

[1] Reprinted by permission of the publishers from F. J. Roethlisberger and William J. Dickson, *Management and the Worker—An Account of a Research Program Conducted by the Western Electric Company, Hawthorne Works, Chicago,* Cambridge, Mass.: Harvard University Press, 1939.

The series of experiments that comprise the Hawthorne Studies are significant because those responsible for the work were able to investigate many of the dependent variables found in human experimentation, especially those among workers. Ordinarily the assumptions made as to the independent variables preclude the possibility of valid findings. Probably the most significant results of these studies are the facts that workers are affected by factors outside the job to an even greater extent than by those on the job itself and that they organize into informal social groups. These organizations take precedence over management-employee organizations and determine production to as great an extent as do changes of a job-environment nature. The disregard of "outside the job" factors and employee self-grouping has led many studies conducted by management to erroneous conclusions.

Although the Hawthorne Studies are not to be considered the acme of perfection or even model, they nevertheless represent a vast improvement over all the other work that has been done in the field. It is for this reason that they are reviewed in their entirety in this early chapter. The serious student of industrial psychology will thereby gain a panorama of the field. He will be able to understand the need for experimentation and he will see the difficulties of it. He will note that verbalisms are poor substitutes for facts. Further, he will acquire a sense of continuity. The Hawthorne Studies show the complete interrelatedness of the various problems and demonstrate that changes in work environment, rest pauses, hours of work, hours in the working week, fatigue, monotony, incentives, employee attitudes, employee organization both formal and informal, and employee-employer relations are all intimately related. To treat them as if they were separate is to introduce such artificiality as to make the setup unreal.

The Hawthorne Studies can be conveniently divided into five major parts, one of which has two subdivisions. Each part is an outgrowth of the preceding one. In many respects each follows the other logically, but no one could have predicted the complex nature of the findings or the ramifications of procedure from the simple, unpretentious beginning. The five studies are referred to as:

1. Experiments on Illumination
2. Relay Assembly Test Room
   a. Second Relay Assembly Test Room
   b. Mica Splitting Test Room

3. Mass Interviewing Program
4. Bank Wiring Observation Room
5. Personnel Counseling

### Study 1. Experiments on Illumination

The first experiment on illumination was conducted in three selected departments. The work performed in one department was inspection of small parts; in the second department relays were assembled; and the job in the third was winding coils. For the control situation, all employees worked under existing lighting installations so that production could be measured.

In the first department the various levels of average illumination intensity were 3, 6, 14, and 23 foot-candles. The production of the workers varied *without* direct relation to the amount of illumination.

In the second department the illumination intensities were 5, 12, 25, and 44 foot-candles. Production increased, but not solely as a result of changes in illumination. The third department showed similar results. The conclusions drawn "brought out very forcibly the necessity of controlling or eliminating the various additional factors which affected production output in either the same or opposing directions to that which we can ascribe to illumination" (5).

Here, apparently, was a problem that was not as simple as it looked. A second experiment with more refined techniques was set up; it took place in only one department and two groups of workers participated. These groups were equated for numbers, experience, and average production. The control group worked under relatively constant illumination. The test group worked under three different illumination intensities. The influence of any spirit of competition (a factor not part of the experiment) was guarded against by having the two groups work in different buildings.

This second experiment on illumination resulted in perplexing but enlightening results. *Both* groups increased production appreciably and to an almost identical degree. Since this experiment did not show what increase in production could be attributed to illumination, the third experiment was undertaken.

In this experiment further refinements in procedure were introduced. Only artificial light was used, daylight being excluded. The control group worked under a constant intensity of 10 foot-candles. The test group began with 10 foot-candles but the intensity was reduced by 1 foot-candle

per period until they were working under only 3 foot-candles. This group of employees maintained efficiency to this point despite the discomfort and handicap of insufficient illumination. In a fourth experiment two volunteer girls worked in a light-controlled room until the intensity equaled that of ordinary moonlight. At this stage they maintained production and reported no eyestrain and less fatigue than when working under bright lights.

The fifth and last of the illumination experiments was conducted with the girls who wound coils. During this experiment there was no real change in production. At first the intensity of the lights was increased daily, the girls reporting that they liked brighter lights. An electrician then changed the light bulbs but kept the same intensity. The girls commented favorably on the increased illumination. In the last part of the experiment the illumination was decreased; the girls said that less light was not so pleasant. However, they felt the same way when the lights remained constant, even though the electrician was supposedly reducing the illumination.

In most such experimentation the sponsors would have thrown out the evidence and the "crackpots" responsible; it would have been considered a wild nightmare, to be repressed and suppressed. Fortunately in this instance, although the specific problem was not solved, there was an awareness that more knowledge concerning the problems involving human factors was essential. The Relay Assembly Test Room, the second of the Hawthorne Studies, was the result.

### Study 2. Relay Assembly Test Room

The initial purpose of this experiment, which lasted about five years, was to exercise more direct control over any of the many variables that could have influenced the performance of the operators in the first study.

In order to exercise greater control it was decided to use a small group of employees in a separate room away from the regular working force. The task chosen was the assembly of small relays, because it is simple and highly repetitive (approximately 500 a day), requires no machinery, and permits an accurate measure of production.

Two experienced operators who were friendly with each other were invited to participate; they in turn selected three other assemblers and the layout operator, who assigns the work and procures the parts. The situation was similar to that in the regular Relay Assembly Department except that in the regular department there was one layout operator for six or

seven girls. The only other person in the room was a man who had worked on the illumination experiment. He was to keep records of what occurred and create and maintain a friendly atmosphere. A special room was fitted out, but chairs, fixtures, and work layout were similar to those in the regular department. An accurate recording device was added to the regular
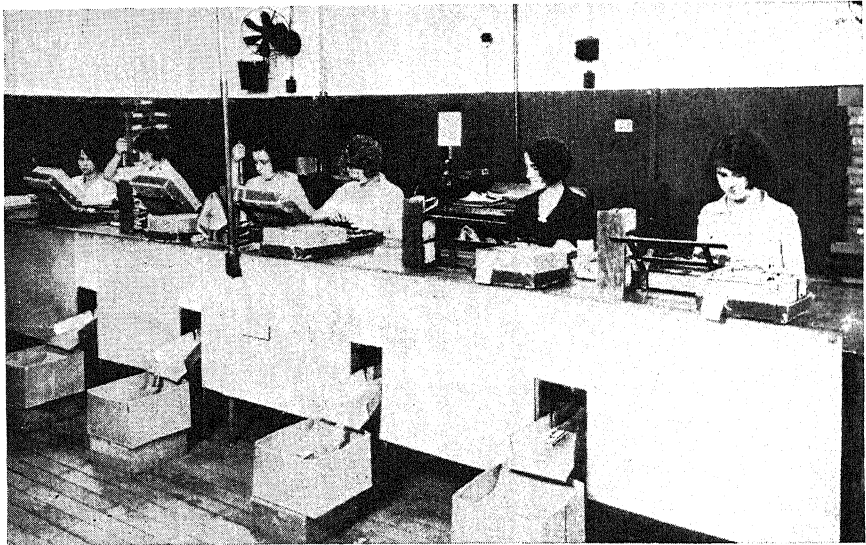
*Figure 2.1.* Relay Assembly Test Room Operators.

equipment so that it was possible to measure not only the number of relays assembled but also the time taken per relay. Temperature readings and humidity were recorded hourly. The girls took physical examinations every six weeks.

A complete daily history was kept to give an accurate account of what went on in the test room as changes were introduced. The following is an excerpt from this history:

Monday, June 13, 1927
- Operator 1A. Said she was tired today.
- Operator 2A. Tired also and said her head ached.
- Operator 3. Was asked if she thought she did more, less, or about the same amount of work. Ans. "More, I'm almost up to Operator 4 and I have a bigger relay."
- Operator 4. "I feel fine today, not tired or anything."
- Operator 5. "I'm tired today and sleepy."

Tuesday, June 21, 1927

The foreman informed the group of their low activity for the past week. The weather was more favorable for work, cloudy and raining.
Operator 1A. "I feel fine today. Just right for work."
Operator 2A. "Today is fine for work."
Operator 3. "I went to bed at 9 o'clock last night and feel O.K. today."
Operator 4. "I feel great today."
Operator 5. "A day like this is much better for work than yesterday."

Study 2 started with six questions:

1. Do employees actually get tired out?
2. Are rest pauses desirable?
3. Is a shorter working day desirable?
4. What are the attitudes of employees toward their work and toward the company?
5. What is the effect of changing the type of working equipment?
6. Why does production fall off in the afternoon?

To answer these questions 13 test periods were introduced.

The first test period made it possible to get an accurate measure of each girl's production under typical work conditions. The second test period attempted to determine the effects of a change in work place upon production. The third period introduced a change in the method of payment; the six girls were paid directly according to the output of their own group, whereas previously they had been paid on the basis of the production of the entire group of about 100 operators.

In the fourth period two rest pauses of five minutes each were introduced. In the fifth, these rest pauses were increased to ten minutes. Period 6 had six rest pauses of five minutes each. In period 7 two rest pauses were given and a "free mid-morning lunch" was added. The morning rest was fifteen minutes and the afternoon one was ten minutes. Period 8 had working conditions similar to those in period 7, but the working day was a half-hour shorter. Period 9 was the same as period 8, but the workday was shortened another half-hour. Period 10 returned to the conditions in period 7; that is, the day was one hour longer than in period 9. In period 11 the group went on a five-day week. Period 12 saw the group return to the conditions of period 3—no rest periods, no free lunches, and a full work week. Period 13 was essentially a repetition of periods 7 and 10 except that the operators furnished the morning lunch and the company supplied the beverages.

The variation in conditions produced extremely interesting results. The production of these girls climbed. Each test period had higher production
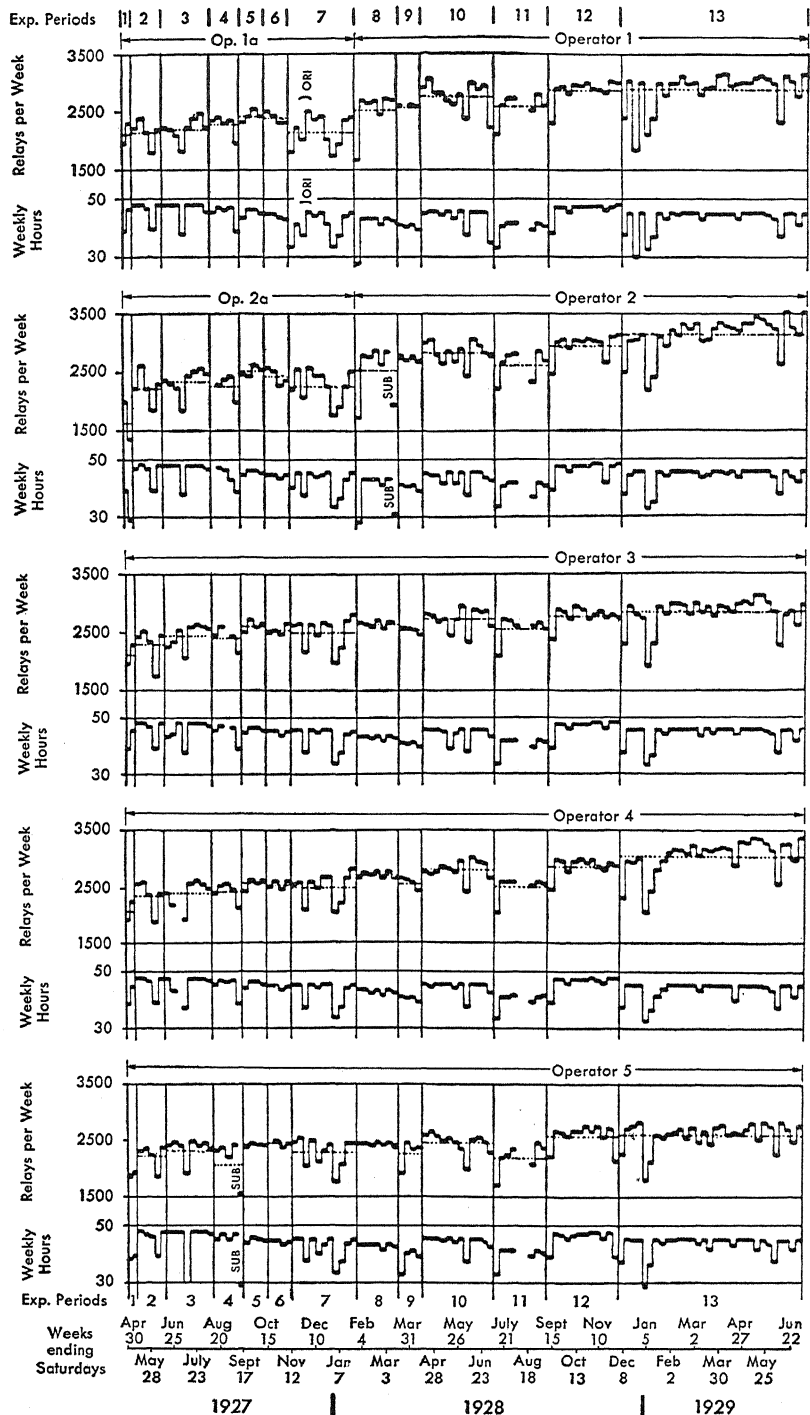
*Figure 2.2.* Total Weekly Output, Experimental Periods 1–13, Relay Assembly Test Room.

records than the preceding one. Figure 2.2 and Table 2.1[2] present the general results.

However, to present the results of the second study in such an objective form as production records is to lose sight of the meaning and implications of the study. The important qualitative aspects will therefore be summarized.

Table 2.1. Relay Assembly Test Room Data

| Period | Length in Weeks | Experimental Conditions of Work | Experimental Working Hours per Week[a] | % Decrease from Standard Working Hours |
|---|---|---|---|---|
| 1. | 2 | Standard | 48 | |
| 2. | 5 | Standard | 48 | |
| 3. | 8 | Standard | 48 | |
| 4. | 5 | Two 5-min. rests | 47:05 | 1.9 |
| 5. | 4 | Two 10-min. rests | 46:10 | 3.8 |
| 6. | 4 | Six 5-min. rests | 45:15 | 5.7 |
| 7. | 11 | 15-min. rest and lunch in morning 10-min. afternoon rest | 45:40 | 4.8 |
| 8. | 7 | Same as 7, but 4:30 stop | 43:10 | 10.0 |
| 9. | 4 | Same as 7, but 4:00 stop | 40:40 | 15.3 |
| 10. | 12 | Same as 7 | 45:40 | 4.8 |
| 11. | 9 | Same as 7, but Sat. morning off | 41:40 | 13.2 |
| 12. | 12 | Standard | 48 | |
| 13. | 31 | Same as 7 | 45:40 | 4.8 |

[a] By "experimental working hours" is meant the total time lapse between the official starting and stopping time for the day (standard working hours), from which the time decreases due to the experimental conditions of work listed above have been deducted.

Periods 1 through 3 successfully accomplished the transfer of the girls from the factory to the test-room situation. A group formation began to take place among these girls. They were allowed to talk more freely, and the supervisor's role, as they had known it, changed.

The second phase carried through four test periods and was mainly concerned with rest pauses. Although, on the basis of the data acquired, the

[2] Figs. 2.1, 2.2, and 2.3 and Table 2.1 are reprinted by permission of the publishers from F. J. Roethlisberger and William J. Dickson, *Management and the Worker—An Account of a Research Program Conducted by the Western Electric Company, Hawthorne Works, Chicago*, Cambridge, Mass.; Harvard University Press, 1939.

experimenters believed that a rest period should occur somewhere between 9:30 and 10 A.M., they had no idea as to where to place the afternoon rest pause. In accordance with the general policy followed in the test room, the girls were consulted. The girls suggested that rest periods occur at 10 A.M. and 2 P.M. Some of their comments were as follows:

Operator 1A. Gee, that's the berries! It rests you to have five minutes like that. (To 3) Don't you like it?
Operator 3. Yes, I do.
Operator 4. I like the rest period, but I think one every hour would be better.
Operator 5. It rests you a little bit.

Since output increased even though the rest period reduced the work week from 48 to 47:05 hours per week, the two rest periods were doubled, the work week thereby being reduced to 46:10 hours. An immediate and definite rise in the average output occurred. At this point the girls expressed happiness over the increase in production and earnings but disagreed among themselves as to how to explain it. They also showed some apprehension as to whether they really would receive the increased earnings—one girl said, "We earn 80 percent but we'll only get 60 percent." The girls were offered the opportunity of getting their increases once a month but did not like the idea, for they believed that the company would find some way to avoid paying them. The experimenters state that these fears were irrational and unjustified; they sound as if they were proud that the girls were willing to express such fears. Right then they could have realized that the bonus system of payment was involved and that there was distrust. In this experiment the bonus idea was dropped. The implications are important and should be noted.

The girls were then put on six five-minute rest pauses, although they were unanimously in favor of two fifteen-minute periods. They did not favor this workday even though the work week was reduced to 45:15 hours. Typical comments were: "I'm getting 'nuts' on this job." "I don't know what I'm doing." "I feel 'goofy' today." "I don't like these rest periods." "I just get started to work and then have to stop." In period 7 the work week was increased to 45:40 hours and a mid-morning lunch was served. The girls favored this period.

Analyzing individual production records during these first seven periods shows that operators 3 and 4 tend consistently to increase production. Operator 5 tends to maintain production consistently with only one spurt. Operators 1A and 2A are similar in production. Their trend is downward in periods 2 and 3, rises in 4 and 5, and drops in period 7. These two girls

had been doing lots of free talking and were considered antagonistic and uncoöperative. They were finally replaced in the experiment. This is another important clue that was overlooked by the experimenters.

The third phase of the Relay Assembly Test Room experiment was concerned with a shorter work week (periods 8, 9, and 11). The three remaining periods (10, 12, 13) were checks. The operators were given the choice of starting work a half-hour later or ending a half-hour sooner. They chose the latter unanimously. This brought the work week down to 43:10 hours. Output did not diminish and the girls liked the shorter schedule. Some comments were: "It's fine, and we still make our rate too." "I'll never get tired of it. Last night I had a whole streetcar all to myself." "I like it." In period 9 the workday was reduced another half-hour, the total work week being 40:40 hours. Although the girls were in favor of a shorter working day, this was "too drastic." The total weekly output was lowered. The rate of output did not diminish, but the girls became quarrelsome. Operator 2, for example, scolded the other girls for not working hard enough. In period 10 they returned to the full 48-hour week with two rest periods of fifteen minutes in the morning with free lunch, and ten minutes in the afternoon. They did not like it; they claimed greater fatigue and expressed disinterest in their increased earning capacity. It is interesting to note that this "fatigue" was not mentioned in period 7, which was identical.

At this time the girls were given a questionnaire on health habits and psychological attitudes. They reported that they felt better in the test room but gave varied reasons. In answer to the question "What do you think has made it possible for you to increase your earnings since you have been on the test?" they replied: "Greater freedom"; "absence of bosses"; "more personal attention"; "opportunity to set one's own pace." Further questioning brought out the fact that freedom from rigid and excessive supervision was the important factor in determining the girls' attitude toward work. In other words, rest pauses, a free lunch, a shorter work week, and higher pay did not, in the minds of these girls, count for as much as freedom from such supervision.

Period 11 introduced the five-day week with the same rest pauses as in period 7. The girls were paid the basic hourly wage for the hours not worked on Saturday. No clear-cut drop in production was apparent; but since this period was disrupted by vacations, it is possible that it was introduced mainly as a "marking-time" period for all concerned. This is unfortunate in view of the popularity of the five-day week now, but in

1928 this was not so prevalent. Again, the experimenters missed an important clue.

Period 12 returned to the full 48-hour week without rests. The girls were informed that this period would last about three months and were asked to work in their normal fashion. Although the average hourly output dropped, total production reached the highest peak of any period. However, the girls took their own rest pauses during this period. They would eat candy and get thirsty, so they went to the drinking fountain; in addition, there was much laughing and boisterous joking. The girls still liked the test room better because they could scream and have fun and because they had no bosses. Operator 3 at this stage told the test-room observer to "shut up."

In period 13 the rest periods were resumed. The girls furnished their own lunch, but the company furnished the tea. During this period it was observed that instead of antagonistic competition the girls worked toward a common goal. If one girl slowed up because she felt ill, the others would speed up. The total weekly output rose.

Since a careful record of "personal time" out taken by employees was kept throughout the experiment, there is clear-cut evidence to show that organized rest periods decreased this personal time out but also decreased the work week. For example, in periods 3 and 12 (no rest periods) personal time out averaged fourteen minutes. In periods 7, 10, and 13 with twenty-five minutes of rest periods it averaged seven minutes. In other words, the working day was shortened by eighteen minutes instead of twenty-five minutes. Physical examinations showed that the health of the employees was not impaired during this study. Absenteeism for these six operators while working in the factory averaged 15.2 irregularities but dropped to 3.5 irregularities in the test room. This is most probably to be attributed to a change in employee attitude.

The girls liked the work week with no Saturdays best of all. (Next they preferred the 4:30 P.M. stop with rest and lunch.) The experimenters report that it is doubtful if the girls would have been unanimous in their approval had they not been paid for Saturday morning off. The present writer does not understand the doubt on the part of the experimenters.

During the course of this experiment the girls' attitude toward those in charge of it changed continually. In the early stages there was apprehension and fear. This finally disappeared as a result of the fact that the girls were consulted and informed about the various stages. By period 13 they liked the test room and its pleasanter, freer, and happier working condi-

tions. In other words, they preferred the lack of restraint and excessive supervision. The test-room observer was regarded as a friendly representative of management and not as a supervisor who "bawls us out."

Another change that took place was the solidifying of the group. Four of the girls started going out with each other and all of them helped the others with their work. They no longer worked as individuals.

The experimenters were perplexed by the general trend toward increased production independent of rest pauses and shorter hours and by the improved mental attitude of the girls. Five tentative explanations were suggested to explain these facts:

1. Improved material conditions and methods of work.
2. Shorter hours, which provided a relief from cumulative fatigue.
3. Shorter work periods, which provided a relief from monotony.
4. Wage incentive plan.
5. Changes in method of supervision.

The first explanation was dismissed. T. N. Whitehead, who analyzed the entire body of data (6), finds no conclusive evidence to support it. There was no significant correlations between physical conditions and production. The second and third explanations were dismissed after careful examination of the daily work curves of the operators. There was no evidence that these curves resembled fatigue curves, and only one operator's work curves showed a resemblance to the monotony curve.

In order to establish the truth or falsity of the wage incentive as an explanation, two minor studies were made. These were known as the Second Relay Assembly Test Room and the Mica Splitting Test Room. The original Relay Assembly Test group had a change of environment as well as of payment, whereas the Second Relay Assembly group had only a change of payment. Five experienced operators were put on a payment basis similar to that of the original group but were kept in the factory. This group increased production almost immediately by 12 percent and they continued at this level; but when they went back to the original method of payment there was a drop. These facts were interpreted by the experimenters to mean (1) that the formation of a small group to determine piecework earnings was an important factor in the Relay Assembly group and (2) that subsequent rises in test-room production could not be explained in terms of this factor alone. A very important point is that the morale of the entire department was shattered. The other operators wanted similar consideration (and possibly the chance to earn

more money). Because of the friction in the department, this experiment had to be discontinued.

In the Mica Splitting Test Room experiment the basis of wage payment remained at the same individual piece rate, but changes in working conditions similar to those in the test room were made. The primary purpose was to study the effects of the change in payment in the test room. Five operators took part in the experiment; two were selected at random and they chose the other three. Their production rose an average of 15 percent in 14 months. In the Second Relay group production rose 12 percent and the Relay Test Assembly Room rise in output averaged 30 percent. It can be assumed that 15 percent is the maximum that can be attributed to a change in financial incentive; the remainder must be attributed to other factors. The experimenters present two conclusions based upon the evidence:

> 1. There was absolutely no evidence in favor of the hypothesis that the continuous increase in output in the Relay Assembly Test Room during the first two years could be attributed to the wage incentive factor alone. 2. The efficacy of a wage incentive was so dependent on its relation to other factors that it was impossible to consider it as a thing in itself having an independent effect on the individual. Only in connection with the interpersonal relations at work and the personal situation outside work, to mention two important variables, could its effect on output be determined.

By period 13 the experimenters realized that they had not studied the relation between output and fatigue, monotony, etc., but had performed a sociological and psychological experiment. By trying to control variables they had introduced a new one, a social situation that involved changed attitudes and interpersonal relations.

The chief result of years of work had been to demonstrate the importance of employee attitudes. For management, however, there were other practical results. They introduced rest pauses on a wide scale. They began to question many assumptions they had previously made and they realized the errors of oversimplification. They saw that one could not predict the effect of a single factor if it was part of a total situation. They also realized the importance of gaining more knowledge about employee attitudes; this led to Study 3.

## Study 3. Mass Interviewing Program

Study 2 allowed the surmise that a relation existed between employee morale and supervision. It was believed that an improvement in super-

vision would improve morale. Since there was a dearth of facts on how to improve supervision and the material that was available was highly opinionated, it was decided to interview the employees in order to secure information. The Relay Assembly Test Room experiment showed that the employees were exceedingly disparaging about the supervision, whereas management had believed that the supervision, especially in this department, was good. This raised the possibility either that management knew little about what constitutes good supervisory methods or that they knew nothing of the employee attitudes on the subject. Thus in this experiment the emphasis shifted from a study of changes in environmental work conditions to a study of human relations or of attitudes concerning human relations.

The Relay Assembly Test Room also showed that as the girl's attitudes improved toward each other, their work, the supervisor, and the company, their production increased. In other words, their morale affected their production. The company had been conducting supervisor training courses and it decided that instruction in improving employee morale should be part of this course. Five meetings were planned, but two sessions made it clear that no factual data were available for this purpose. Consequently, as has been said, it was decided to interview the employees.

The interviewing program was launched in the inspection branch, in which about 1600 workers were employed. Three men and two women supervisors were chosen to conduct the interviews; they were told that the purpose was to gain information about employee attitudes, *not* to spy on supervisors or anyone else.

The first interview was conducted as follows:

1. Each interviewer was assigned a certain territory to cover. From the foreman of each department in his territory he was to obtain a list of the employees' names.
2. When the interviewer was ready to start interviewing in any department, it was recommended that he first go to the foreman in charge and make his presence known.
3. It was recommended that the interviewer select the man he wanted to interview because otherwise the supervisor might be tempted to give him all his "problem cases" first. However, the interviewer was to cooperate with the supervisor so that the operation of the department would be interfered with as little as possible.
4. The interviewer was to ask the supervisor's advice about where the employee should be interviewed—whether away from the job or on the job. (Subsequent experience showed that it was usually advisable to interview an

employee away from his work. Thereafter it was recommended that the interviewer ask the department chief for a bench or desk where he could conduct the interviews without interruption.)

5. The interviewer was to make sure that the necessary arrangements were made for paying the employee his average earnings for the time consumed in the interview.

6. In his contacts with supervisors the interviewer was to be careful not to betray the confidence of any employee and to refrain absolutely from discussing the content of the interviews with the supervisors.

7. Only a few employees from any one location were to be interviewed on the same day, so that the work of the department might go on normally and without undue confusion or curiosity.[3]

Careful instructions with regard to approaching the employee and conducting the interview were also given the interviewers:

1. Whenever possible, the employee was to be formally introduced to the interviewer by the supervisor. Interviewers were not to interview employees whom they knew, because the acquaintance might influence the employees' comments.

2. When the interviewer and employee were seated and ready to proceed with the interview, the employee was to be told the interviewer's name again.

3. The interviewer was to explain to the employee the purpose of the interview, i.e., why any comments, either favorable or unfavorable, that the employee cared to make about his supervisors, working conditions, and job were being solicited.

4. The employee was to be told how the interviews would be used; for example, any complaints he had about working conditions would be investigated together with those of the other employees, and, as far as practicable, remedial action would be taken. The manner in which the material gathered from the interviews was to be used in supervisory training conferences was also to be explained.

5. The interviewer was to make clear to each employee that the interviews would be kept strictly confidential; i.e., the employee could tell the interviewer anything, no matter how bad it was, without getting in trouble himself or getting his supervisors or his co-workers in trouble. The interviewer was to explain that no names or company numbers would appear on any records and that the people who read the interviews or heard them read would not be told who the employee was or where he worked. Anything the employee said which might identify him with his supervisor would be deleted from his interview.

6. The employee was to be told that the company was as much interested in the things he liked as in those with which he was dissatisfied and which he thought needed to be corrected.

7. The interviewer was to take almost verbatim notes as the employee talked. He was to explain to the employee that he was writing down what was

[3] *Ibid.*

said word for word so that there would be no possible chance of misrepresenting or forgetting anything. (At first it was thought that taking notes might make the employee reluctant to talk, but this was found not to be true.)

8. The interviewer was to be sympathetic and a good listener, and to let the employee know that he was really interested in his problems and complaints.

9. Strict care was to be taken to express no agreement or disagreement with the complaints the employee made. The interviewer was to let the employee know that he himself was in no position to judge the correctness or incorrectness of what the employee was saying.

10. The interviewer was not to inform the employee of the nature of the complaints made by other employees.

11. The interviewer was not to give the employee advice as to what he should do. In rare cases he might advise an employee to see his supervisor, or tell him about the various benefit plans, the Hawthorne evening school, or similar things. However, the interviewer was not to hesitate to offer encouragement to any employee if he thought it would do him good.

12. The interviewer was to write up the interview under six headings. The opinions of the employee were to be divided first into three categories: working conditions, supervision, and job. Each of these headings was to have two subclassifications, likes and dislikes.[4]

The reaction of the employees to this program was generally very favorable. A typical reaction was, "It is a good idea to interview the operators, as they may have something in their minds that they want to talk over with someone and this gives them a chance to do it." Another type of reaction was, "I never really thought this interviewing amounted to very much, but since you explained it to me I see where I can tell you something that may help in the supervisors' conferences." Other reactions were illustrated by still another type of response: "Now maybe some of the people will take a hint and learn that they have not been doing the right thing, especially some of these underhanded bosses. I hope they get their share of this."

Some employees attributed changes in conditions to the interviews when in reality the only change that occurred was in the attitude of the person interviewed. For example, one woman believed that the food in the cafeteria was better. Some employees, on the other hand, believed that management would make no changes at all; a few were very suspicious.

Naturally, one should expect all types of reactions to an interviewing program, and this was no exception. The success or failure and the final total reaction depend entirely upon whether the employees understand

[4] *Ibid.*

and endorse the real purpose and whether the company's actions conform to it. Because in this instance they did, it was possible to obtain a tremendous amount of information that could not have been secured in any other way. Not only was employee reaction favorable; the reaction of the supervisors was also. One quotation illustrates this: "Did you go to the last conference we had? Say, they are getting to be good. You know, I am getting a lot of help from them. I am learning to see the operator's viewpoint of things, and really believe I am learning to do my job much better by attending these conferences."

Another outstanding aspect of this part of the Hawthorne Studies was its flexibility. The program was expanded and the method of conducting interviews underwent drastic changes as the facts became known. Although originally the interviews were not meant to be of the questionnaire variety, there nevertheless was a typical way of beginning each interview and during its course specific points were covered by direct questions.

At conferences it was reported that employees often discussed irrelevant topics, that is, irrelevant from the point of view of the subject matter the interviewers were to cover—supervision, working conditions, and the job. Since this happened fairly frequently, it was decided that these discussions were not irrelevant at all. Analysis showed that direct questions put the employees in a "yes or no" frame of mind, often impeded the progress or the interviewer, and inhibited the spontaneous expression of their real convictions.

As a result, the interview procedure was changed to the "indirect method." The employee had considerable freedom in choosing his own topic at the start of the interview and the interviewer allowed him to continue to talk. This change in technique resulted in an increase in the average length of the interview from a half-hour to one and one-half hours. The material on which the report was based also increased from two and a half to ten pages. When the program was suspended because of the depression, 21,126 employees had been interviewed.

The ramifications of the various phases of the interviewing program were many. The interviews had a real effect on the company's supervisor training courses. It provided management with a list of complaints about specific environmental conditions that could be investigated. Data concerning employee attitudes and opinions were made available on a large scale. It was also found that the employees benefited psychologically merely as a result of being interviewed.

However, certain perplexing problems arose as a result of the program. For example, employees reacted differently to the same surroundings. Thus some expressed satisfaction with the same thing that others considered unsatisfactory. Comments during the interview were expressed as either fact or sentiment, but often no distinction was made in the mind of the person being interviewed. In other words, the employees were reacting to a personal situation on the basis of their previous social conditioning. Further, they were responding as part of the social organization of the group in which they worked and in relation to their position in this group.

The program showed that such items as wages, hours of work, and physical conditions could not be considered as factors in themselves. Instead they should be considered as carriers of social values. They could be understood only through the acquisition of information about the individual's position or status in the group in which he worked and in the company as a whole. Thus the meaning assigned to wages, hours of work, locker rooms, etc., varied according to the employee's position in the group, the group attitude toward the specific item, and his relations with people outside the job.

From this it followed that information should be obtained not only about the individual's attitudes and opinions but about the social groups that existed. Evidence acquired in this phase of the study indicated that these groups, about which management knew nothing, could exercise considerable control over the work behavior of the individual members. Restricted output, which often occurs in industry, was found to exist in the plant. Hints indicated that it was probably the result of the formation of social groups and the resulting pressures. There was also some evidence of the development of informal personal leadership in these groups. The existence of this type of leadership was not recognized by management, even though it was likely to be as important as any other factor—in some cases more so—in the group's acceptance or rejection of management's regulations. It was in this setting that the fourth study was begun.

### Study 4. Bank Wiring Observation Room

This part of the Hawthorne Studies attempted to obtain more exact information about social groups within the company. The preceding study had progressed from the proposed guided interview to a more intensive type of unguided interview, and then to a series of interviews

with one person. In it, the emphasis was on obtaining information from large numbers of employees. The last phase of the program pointed to the need to go back to a study of the Relay Assembly Test Room type, in which information of an intensive nature would yield data on the social groups in existence. The reports of two of the interviewers will serve as a good introduction to the fourth of the Hawthorne Studies.

They [the employees] firmly believe that they will not be satisfactorily remunerated for any additional work they produce over the bogey, or that if they do receive more money it could only be for a brief period, at the end of which the job would be rerated. Because of the belief that rates may ultimately be lowered if output is too great, there seems to be a tacit agreement among the members of this group to limit their production to the bogey requirements on each operation. Seldom do they exceed the bogey by a large margin. Most of the work is turned out in the morning in order that they can "take it easy" during the latter part of the afternoon. When questioned as to whether or not their earnings would be greater if they turned out more work, they claimed that the difference, if any, would be negligible because the percentages made by the other groups tend to pull theirs downward. To this general scheme all their attitudes and behavior are related.

The leader in this group is one of the two group chiefs, undoubtedly a very significant factor in giving the group a strong feeling of security. This supervisor, A, was at one time on the bench in the same group which he now supervises, but he refused to allow the change to alter his relations with the men. From observing the group one can hardly draw a line between supervisor and employees. It is obvious that he is very popular with them; no one has any adverse criticism to make of him. He is very close to the men, keeping them well informed at all times as to the group standing in the department, i.e., relative percentages, rates, output, etc. When asked why they consider him a good supervisor, his men replied with such statements as: "He knows his stuff," "He's fair and impartial," "He'll go to hell for you and make sure you get plenty of work." In short, all their statements implied a firm conviction that this group chief would protect their interests. By way of contrast, while A was on sick leave, another supervisor, B, took over the group. Toward B the employees expressed strong antagonism. B is an older man, further removed from the interests and sentiments of his subordinates. He is not quite trusted by the men and commands very little respect. As one employee sized him up, "When he bawls you out, he is more nervous than you are." This group is only vaguely conscious of the other supervisors in the department; in fact, a confusion of the supervisory ranks is quite evident. For example, C, a section chief, has held the same position for a number of years; but the men cannot figure out what position he holds in the department, who reports to him, or what his duties are.

An attitude common to this group, but existing in varying degrees of intensity, may be characterized as a lack of ambition and initiative and a complacent desire to let well enough alone. Most indifferent is their attitude toward ad-

vancement, referring, of course, to promotion or higher-grade work. Whereas it is usual in any group to find several employees striving to improve their position, here only one or two seem to be interested. The others merely say, "All we are here for is the old pay check." Sometimes they speak of the department as the "Old People's Home" because, quoting one man: "The fellows get in here and don't seem to want to get away. Take a fellow like me. I have been on this job ten years. If I was transferred out, I would have to start all over again and I would have a pretty tough time."

In their group life they are congenial and happy-go-lucky. This is obvious not only during rest periods but also while they work. Side play is frequent, and good-natured bantering constantly flashes back and forth. During rest periods everyone either plays cards or stands by as an interested spectator, and in these games rivalry is always keen but congenial. Several of the newer men express the consensus of opinion by describing their associates as "a swell bunch of guys."[5]

Another investigator reporting on a different group tells a different story.

A says B gets mad because he (A) does too much work: "B sometimes tries to do as much as I do, and whenever he can't make it he gets mad and swears about it. Then he will go over to some of the others and say that I am trying to kill the bogey." The girl assemblers in the group tell A that he should not stand for the treatment he gets from the group chief. They tell him he does the most work and gets the least recognition.

A mistrusts D because D represented himself as a sort of a supervisor to A and took the easy jobs when A first came to work here. He is not friendly with E because E does favors for everyone but him. His friends are an old man, G, and the girls. When B was called to the office because his production was too low, A told him it was his own fault. B then said, "What! Do you expect us to come down here and slave?"

B is 36 years of age, a rather stocky, well-built, athletic type. Although he supports his father and mother, their dependence apparently serves to accentuate his own manhood. He says that the supervisors are all satisfactory. He knows them well because he has worked here so long. He takes a senior position in the group and gets along well with everyone but A. His attitude toward A is indicated by the incessant "kidding" to which he subjects him. He attributes to himself all the best characteristics of virile manhood and attributes to A feminine characteristics. He says that A is an hermaphrodite. He demonstrated in the first interview how A swings his hips and carries himself like a woman. B thinks that A works hard because he is "dumb," and that nobody likes A because he does so much. He explains that A sits all by himself (in reality he sits next to B), and nobody will talk to him, so all he can do is work from the first whistle to the last. B was once offered a position as supervisor which he refused.[6]

[5] *Ibid.*
[6] *Ibid.*

The need for a more systematic inquiry resulted in the selection of 14 male operators who were to work under standard shop conditions. These workers were observed and interviewed over a period of six and a half months; the study was terminated when work ceased because of the depression. This group of men were reluctantly assigned to a separate room. By this time the researchers knew that such a change is often of importance; however, it made possible better control of the study. The observer was stationed in the room; he was to assume the role of a disinterested spectator but was not to set himself off from the group. He adhered strictly to the following rules: (1) Give no orders and in no way demonstrate authority. (2) Do not take part in arguments. (3) Do not enter into conversation or seem overanxious to hear about what is going on. (4) Never violate confidences of employees.

The observer was asked to note the formal organization of supervisor and employees, and also all informal groupings of the men. Further, he was to observe the interrelations of these two types of organizations. The interviewer did not enter the test room. His function was to gain insight into the workers' attitudes, thoughts, and feelings, whereas the observer was to describe the actual verbal and overt behavior of the group. Working thus together, these two were to gather data from this group concerning the department, the company, and the community.

The workers in the Bank Wiring Observation Room study consisted of three groups: nine wiremen, three soldermen, and two inspectors. Each did a specific task but necessarily collaborated with the others. This department was chosen because it met such criteria as (1) the sameness of the task; (2) exactly determinable output; (3) shortness of task (one minute required); (4) work pace determined by operator; (5) assurance of continued work; (6) the ease of removing the group as a unit from the department; (7) the experience of the operators. These criteria were similar to those used in the Relay Assembly study, but from this point on there was a difference.

The men were invited to coöperate in the study. The first week they worked or appeared to be working all the time. They were cautious toward the observer. When they complained to him about poor lighting, he told them that he had no authority and suggested that they refer all complaints to their supervisor. It was three weeks before the men started to relax and behave more as they did in their regular department. It was learned that these men did not think that either the group chief or the

section chief had much authority. The foreman spent little time in the room so they were relatively free from authority.

The system of payment was a complicated wage incentive plan that had been instituted to promote efficiency by encouraging production; it was also believed to be a fair means of apportioning employee income. It was soon found that this wage plan was not working. The workers defined a day's work as the complete wiring of two units and either they stopped before quitting time or they paced themselves to last out the day. No uniform explanation or reason was forthcoming for this definition of a day's work by the men, but it completely invalidated the incentive plan, as the following conversations prove:

$W_2$. (After claiming that he turned out more work than anyone else in the group). They [his co-workers] don't like to have me turn in so much, but I turn it in anyway.

(In another interview). Right now I'm turning out over 7000 a day, around 7040. The rest of the fellows kick because I do that. They want me to come down. They want me to come down to around 6600, but I don't see why I should. If I did, the supervisors would come in and ask me what causes me to drop like that. I've been turning out about that much for the last six months now and I see no reason why I should turn out less. There's no reason why I should turn out more either.

$W_3$. No one can turn out the bogey consistently. Well, occasionally some of them do. Now since the layoff started there's been a few fellows down there who have been turning out around 7300 a day. They've been working like hell. I think it is foolishness to do it because I don't think it will do them any good, and it is likely to do the rest of us a lot of harm.

Int. Just how do you figure that?

$W_3$. Well, you see if they start turning out around 7300 a day over a period of weeks and if three of them do it, then they can lay one of the men off, because three men working at that speed can do as much as four men working at the present rate.

Int. And you think that is likely to happen?

$W_3$. Yes, I think it would. At present we are only scheduled for 40 sets ahead. In normal times we were scheduled for over 100. If they find that fewer men can do the work, they're going to lay off more of us. When things pick up they will expect us to do as much as we are now. That means they will raise the bogey on us. You see how it works?

Int. You say there is no incentive to turn out more work. If all of you did more work, wouldn't you make more money?

$W_4$. No, we wouldn't. They told us that down there one time. You know, the supervisors came around and told us that very thing, that if we would turn out more work we would make more money, but we can't see it that way.

Probably what would happen is that our bogey would be raised, and then we would just be turning out more work for the same money. I can't see that.

$W_5$. There's another thing; you know the fellows give the fast workers the raspberry all the time. Work hard, try to do your best, and they don't appreciate it at all. They don't seem to figure that they are gaining any by it. It's not only the wiremen, the soldermen don't like it either. . . . The fellows who loaf along are liked better than anybody else. Some of them take pride in turning out as little work as they can and making the boss think they're turning out a whole lot. They think it's smart. I think a lot of them have the idea that if you work fast the rate will be cut. That would mean that they would have to work faster for the same money. I've never seen our rate cut yet, so I don't know whether it would happen or not. I have heard it has happened in some cases though.

$W_6$. (Talking about a relative of his who worked in the plant). She gets in here early and goes ahead and makes up a lot of parts so that when the rest of the girls start in she's already got a whole lot stacked up. In that way she turns out a great deal of work. She's money greedy. That's what's the matter with her and they shouldn't allow that. All she does is spoil the rate for the rest of the girls.

Int. How does she do that?

$W_6$. By turning out so much. When they see her making so much money, they cut the rate.

$W_7$. There's one little guy down there that turns out over 7000 a day. I think there's a couple of them. And we have to put up with it.[7]

The men devised various means of controlling production. Name calling and minor physical punishment were two of the more common ways of restricting output. Workers who produced too much were nicknamed "Slave," "Speed King," or "Phar Lap" (a champion race horse of that year). They were also "binged." A "bing" is a very hard blow on the muscles of the upper arm. The one who is hit never protests but is allowed to "bing" back.

The men's concept of their average daily production was reflected in rather constant weekly production figures. The men achieved this constancy by reporting more day-work allowances than they were entitled to. In addition they sometimes reported more—or in some cases less—production than they had actually turned out. The primary reason for this was to gain group acceptance.

Three men always reported more work than they actually produced, and two reported less; the others varied their reports. A comparison of morning and afternoon production showed that the faster men slowed down in the afternoon, whereas the slower men worked at a more even

[7] *Ibid.*

pace. Briefly, the findings were that the men were restricting production in accordance with their definition of a working day, thus nullifying the validity of the wage incentive plan. Interpersonal relations apparently were more important than the wage incentive.

The group chief had certain difficulties. In the first place he had to handle the day-work claims of the men. These claims were made to justify being paid at an hourly rate rather than on a production basis. Company rules allowed such claims and they could be made for any number of reasons. The group chief had either to accept these claims as justifiable or be arbitrary in rejecting them. He chose to accept them and thereby gained the good will of his men. It would have been difficult to prove any of the reasons given as being incorrect or unwarranted.

Another problem was job trading. The only excuse for this was physical incapacity, as when a solderman developed a sore finger. Determining how sore a "sore" finger has to be, made this a difficult claim to dispute. Thus the group chief was sympathetic to his men and steered a middle course, and he, in turn, was popular with them. During this study he was demoted because of business conditions and a group chief with greater seniority took over. The new one placed great stress on conduct and efficiency. The men thought that he was exercising more authority than was vested in him, nor did they admit his authority merely because he exercised it. Certainly the first group chief with his leniency received more coöperation than the second one.

The next representative of management was the section chief, and since he supervised a number of groups he was never in close contact with any one group at all times. His function was more managerial and he was considered to be more "in the know" than the group chief. Even though the men argued freely with him, they regarded him as having more authority than the group chief. The assistant foreman, next in the management hierarchy, was listened to with respect, but the men never argued with him. If they disliked what he said, they waited until he left to voice their opinions. The relations of the assistant foreman to the group were pleasant. The foreman was called the "old man." When he came in, conversation stopped and no one knowingly broke any of the rules. The men showed apprehension while he was present.

Considering the management-employee situation, it was apparent that although communications traveled down in the form of orders, the two first-line supervisors were likely to be questioned. But there was a gap in communications on the way up from employee to foreman. Consequently

the foreman and top management were unaware of the reasons for the failure of the financial incentive. The fact that the men reacted differently from the way it had been assumed they would made the incentive plan ineffectual and was something the supervisory organization could not remedy.

The relations among the employees were especially interesting. The men worked according to "their standard" of production, but in addition they talked, argued, played games, matched coins or indulged in other forms of gambling, formed cliques, took sides, traded jobs, shared candy, insulted one another by belittling nationality and religion, and helped one another in their work. They nicknamed each other "Runt," "Shrimp," "Jumbo," and "Goofy." Their conversation ranged from work to women to horse racing. In short, they did many things together, in addition to working.

The connector wiremen, even though their rates might be the same as the selector wiremen were paid, represented the "elite." Going on connectors was a step forward, whereas being put on selectors was regarded as a demotion. The wiremen occupied a social position above the soldermen. Job trading between them originated most often with a request from the wiremen. The soldermen wore goggles which they resented, and the wiremen demonstrated their superiority by expressing disapproval when the soldermen did not wear them. Lowest was the truckman, who transported materials. He was the butt of much horseplay.

The inspectors belonged to a different group. They were responsible to a different set of supervisors. They were not an integral part of the group and were considered outsiders.

A subtle manifestation of status appeared in the way the men dressed. The foreman and assistant foreman wore coats and vests. The section group chiefs wore vests but no coats. The men wore neither coats nor vests. When the men reported for interviews they did not put on their coats, but the inspectors put on both coats and vests.

During lulls in activity the men played games. It was interesting to note that two groups always formed. Group I consisted of four wiremen, a solderman, and an inspector. This group usually gambled. Group II, not as completely set, consisted primarily of one solderman and three to five wiremen. They preferred "binging." The third solderman and the other inspector were isolates, that is, not in either group. These groups or cliques carried over from games to job trading, quarrels over opening and closing windows, and friendships and antagonisms. Furthermore, Group I

regarded itself as the superior or "front-room" clique. They felt that their talks were on a higher plane, they ate chocolates rather than "junk," and they were less boisterous.

A diagrammatic summary of the internal organization is shown in Figure 2.3.
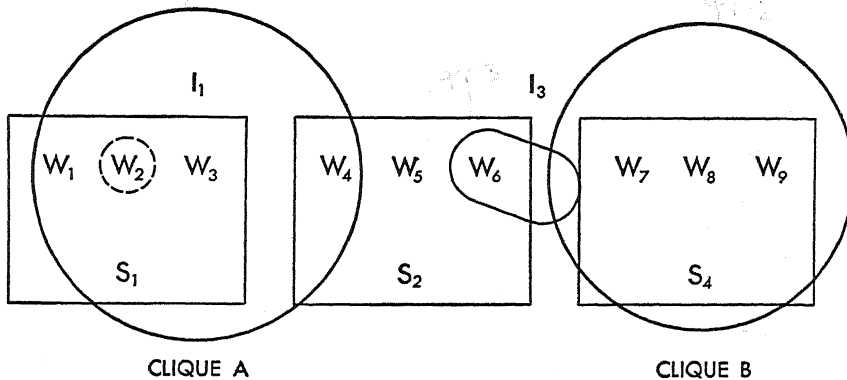
*Figure 2.3.* Internal Organization, Bank Wiring Observation Room.

There were four main determinants of clique membership: (1) you should not turn out too much work (rate busting); (2) you should not turn out too little work (chiseler); (3) you should not tell a supervisor anything that would harm an associate (squealer); (4) you should not act officiously (this applied to inspectors and group chief as well as workers).

This intricate social organization served to protect the group both inside and outside. Control inside was obtained through ridicule, sarcasm, and "binging." Protection outside was afforded by excessive day-work claims and constancy of production. It has already been noted that management knew nothing about the group and its attitudes toward production and management rules until this phase of the study uncovered it. All companies, large and small, have such a setup and under usual conditions they have no way of knowing about it.

### Study 5. Personnel Counseling

The Personnel Counseling study was not begun until four years later, because of the depression. However, these four years allowed for an appraisal of the vast significance of this series of unique studies in industry. The Experiments on Illumination showed that there was nothing re-

sembling a close relationship between a change in physical environment and production. The Relay Assembly Test Room with its continuous rise in production, regardless of the changes, showed the importance of employee attitudes toward job, supervisor, and home. The Mass Interviewing Program not only brought about improved methods of interviewing but uncovered much data on specific attitudes, as when it showed that similar situations and conditions could be sources of satisfaction to some and of

*Figure 2.4.* An Employee Discusses His Problems with a Counselor. (Courtesy of Standard Oil Co. [N.J.].)

dissatisfaction to others. The suggestion of a group formed by the workers led to the Bank Wiring Observation Room study, with its findings on the intricacies of informal organization and the ways in which this affects production and supervisory relations. It also showed the breakdown in the flow of communication from employee to management; management was free to give orders but completely in the dark as to how they were finally received.

Since all four studies indicate both a lack of accomplishment in really promoting employee relations and the importance of this work, the fifth study may be regarded as the culmination of the experimenters' efforts to

bring this important area into focus. There were two objectives. The first was to have a nonauthoritative and impartial agency interview employees to diagnose their problems and work with supervisors on their methods of supervision. The second was to improve the method of communication within the company, in view of the ample evidence indicating that it was lacking in certain situations when the social organization conflicted with the managerial organization. The plan was put into operation with the announcement that "personnel men" would be assigned to the departments and would be around to talk to the employees. The program, which was generally accepted, led to improvement in three fields: personal adjustments, supervisor-employee relations, and employee-management relations. In several cases there were obvious improvements in personal adjustments. Employees showed changes in personality, and freedom from anxiety and other forms of behavior that might be diagnosed as psychoneurotic. The personnel counselors were helpful in making the supervisors see their problems with less emotion and more understanding. Finally, the reports helped management to a better understanding of employee behavior and sentiment so that policies could be formulated that would result in less friction between management and workers.

### Implications of the Hawthorne Studies

The Hawthorne Studies are significant because they represent an honest and concerted effort to understand employees, instead of approaching the problem only from the managerial point of view of increasing "efficiency" on an economic level. Moreover, they are interesting because they are a type of experiment which is rarely performed in industry. They do not try to define a response as the result of the introduction of change; they recognize that it is a result of the specific change *plus* the employee's attitudes, his social situation on the job, and his previous attitudes as determined by his personal history and background.

The Hawthorne Studies have been discussed fully because they are important to industrial psychology. They are not to be considered as the "ideal" experiment or the acme of perfection. There are many reasons for being critical and even for calling the researchers naïve. For example, it may be that the end product, personnel counseling, is merely a substitute for a real need of employees to organize. It may be that the vast difference between the Bank Wiring Observation Room and the Relay Assembly Test Room results was caused by the fact that one group was male and the other female. Evidence from other sources indicates that women regard

supervisors as more important than do men, and they are also more tolerant toward work conditions, possibly because they generally look upon their job as a temporary stopgap until marriage. Further criticisms are avoided lest the wrong impression be created. The Hawthorne Studies can be considered as the coming of age of the subject just as Münsterberg's work might be considered its birth.

There are many reasons why this series of experiments deserves careful study. Although the studies are old when compared with contemporary literature they are nevertheless as timely now as when they were first conducted. Many of the findings tend to be rediscovered and in many instances the newer data are not so adequate—for example, on the importance of employee attitude and the existence of informal employee groups and their controls on production. Similarly, the relation of hours of the work week to production and the fact that a shortening of the work week does not necessarily curtail total production ring a modern bell. Also one must mention that increasing the financial incentive does not always increase production. These are only a few of the findings that are still not believed in many quarters.

However, above and beyond the generalizations based upon the findings are the tremendous implications for research. Too often under the guise of research are the thinly veiled attempts to gather data that conform to existing knowledge and to prove the point that the researcher or investigator sets out to prove. Predetermined conclusions discourage the real search for knowledge. The Hawthorne Studies sought conclusions and the experimentors were not afraid to go in the directions indicated by the data. Their research was not "directed."

Important indicators of the value of any research undertaking are the questions raised as a result of the knowledge acquired. Meaningful questions must often await the answering of questions on a more simple level. Many college professors recognize the value of their presentation in relation to the questions asked as a result of what has been learned.

The significance of the Hawthorne Studies can be understood not only in relation to their findings but also because they are an outstanding example of research that was not steered to predetermined conclusions and because they raised questions that otherwise might not have been asked.

### Summary

The Hawthorne Studies had an unpretentious beginning. The problem was to determine the relation between changes in illumination intensity

and production. As the experimental methodology became refined, the simple answer was more elusive. It was clear that a direct relationship between illumination and production was nonexistent and that the answer would have to be obtained by attacking a different aspect of the problem.

Study 2 tried to determine the effect of rest periods, shorter work week, wage incentives, etc., on production. The results were surprising and yielded information on the importance of employee attitudes. Study 3 sought information on the exact nature of the employee attitudes and on a large scale. It led to a change of methodology from the direct to the indirect method of interviewing and also obtained leads on such important concepts as informal leadership and restricted production. Study 4 was an attempt at a more systematic inquiry and returned to a specific work group. The findings of intricate social organization and its effect on production as well as the need for upward communication resulted in the last part of the study. Study 5, the end product, resulted in the introduction of the personnel counselor in industry.

The Hawthorne Studies represent an outstanding example of experimentation in industry as well as a panorama of the essence of industrial psychology.

In the chapters that follow, the various topics connected with industrial psychology will be presented. Since reference will be made to aspects of the Hawthorne Studies not presented here, it will be well to keep the main findings in mind, both as a frame of reference and as a standard of performance.

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# PART II •

# • Understanding the Employee

THE core of understanding the employee relates to the knowledge of his motives, attitudes, satisfaction, and morale. These terms are not intended to be used interchangeably but rather interrelatedly. This unit is considered basic in the building of a system and discipline leading to a better understanding in the field of industrial relations. It is intended to emphasize that the employee's feeling cannot always be correctly projected or assumed. A better understanding of the subject considered in this unit can lead to progress in the field. It indicates that an employee is complex and complicated, and that panaceas, gimmicks, and short cuts will be more likely to fail than to be successful even in the short run.

CHAPTER 3

# Motivation and Work

WORK is a highly complex phenomenon in our present stage of technological development. To better understand it we need to recognize this, rather than assume an oversimplified push-button concept. Work may be a task, a duty, or an accomplishment. It may be mental, physical, or both. It may be repetitive or creative. Further, it may be drudgery or personally rewarding and its results may be obvious or subtle. Its end product is often evaluated differently by different people. In other words, work takes on different shades of meaning, and most important is the intrinsic meaning that it has for the individual performer and the group with whom he identifies.

Regardless of its meaning, work cannot be considered apart from the individual who performs it. His motives, experiences, and social interrelations with his family, company, and community must always be considered.

To strip work of these attributes is to reduce it to the mechanics of an automatic machine and this cannot be done if we are to understand its meaning. Work has an economic aspect and a mechanical aspect but it also has a psychological aspect. Attempts to overlook this last characteristic result in an oversimplification leading to misunderstanding.

The view that specific incentives will encourage increases in production has not always been substantiated in fact even though management has often attempted to spur production by such offerings and has often attributed production increase to them. Throughout the years production has increased for many reasons, in addition to the particular incentives offered—and sometimes in spite of them.

Industry has generally overlooked the complexity of human motivation and has erroneously oversimplified a highly complex phenomenon. Since the psychologist is especially concerned with understanding an individual

through his motives and has acquired a body of knowledge in this field that often differs from the layman's knowledge, it is necessary to review briefly, from the psychologist's point of view, what is known about motivation at the present time.

### The Complexity of Motivation

The one thing that psychologists know is that an individual rarely if ever behaves in a situation or responds as a result of a single motive. They clearly recognize the complexity of human behavior and understand that a person often does not know the true reason for his behavior. Because of this complex behavior an individual is, in many instances, unpredictable.

A major error in industry has been the oversimplification of the concept of motivation. Too often since Taylor's time (see page 399) it has been assumed that the primary reason why people work is to make money. This is both absurd and unquestionably false. Man in industry is just as complex as man in any other phase of life, and any attempt to reduce his behavior to a single system of motivation must result in artificiality and narrowness. Man has many motives; and unless we recognize the part played by each one we cannot possibly begin to understand his behavior.

When the psychologist talks about motivation, he is concerned with studying the individual with respect to ever-changing physiological conditions and a multitude of previous expcriences. Because of these two factors, physiological changes and previous experiences, it must be recognized that motivation may stem from within an individual or from factors acting on him from the outside. Furthermore, these two categories are not mutually independent; on the contrary, they interact at all times.

The simpler motives originating from physiological imbalance within an organism are generally known as hunger, thirst, oxygen need, the need for rest and sleep, and sex. A good many motives act on the individual as a result of the multitude of his experiences; these are in large part determined by the social pressures of the society in which he lives. Although these social motives are sometimes given only vague and indirect expression, they nevertheless must be recognized as just as important as the so-called simpler motives if we are to be successful in understanding why man behaves the way he does. Gregariousness, self-assertiveness, acquisitiveness, the desire for prestige, and the desire to conform are only a few of the many social motives that act on man.

In the integration of the behavior of any normal individuual at any one

moment many motives are present. The particular behavior that results will depend in part upon the physiological imbalance of the individual, and also upon the pressures of society. For example, a man may be hungry; but if his religion tells him not to eat meat on Friday or bacon at any time, he may go without food. Thirst can be satisfied most easily by water; but the influence of advertising results in our drinking the many "colas," or even beverages that are likely to affect our emotional behavior and that actually have little to do with satisfying the original thirst drive. While it is true that a certain amount of the sex drive is physical, the prohibitions, inhibitions, and repressions are determined so completely by the pressures of society as to lead some people to recommend that young people go in for athletics and take long walks rather than think about this drive.

Motivation is truly complex. Different forms of behavior are sometimes similarly motivated. A desire to be outstanding or to acquire prestige may cause one person to write a book (this is not the author's motive); another may decide to achieve this by dressing effectively, another by marrying well, and still another by remaining single. The next person may decide to fulfill this desire by acquiring wealth. We can go down the list of all the different ways of behaving to achieve this one end. All these different forms of behavior may lead to the same amount of success by achieving the same end. The converse is also true. Different motives may sometimes result in one form of behavior. Thus a person may write a book because he wants to acquire wealth or gain prestige or have an opportunity for self-expression or creativeness.

To complicate matters further, people often do things without being aware of the basic motive or motives involved. The person who is fired may honestly believe that the foreman was biased, instead of realizing that the reason for dismissal is inefficiency. Giving "good" rather than "real" reasons for behavior is known as *rationalization*, a dynamism of which there are many examples. Sublimation, projection, identification, and compensation are a few of the forms of behavior in which the real motive is unknown to the individual. The neurotic does not generally understand why he really is neurotic, although he may know that he is neurotic. A psychotherapist is needed to help him understand the basic motive compelling the particular form of aberrant behavior.

The vocabulary of motivation is large. Such terms as motive, purpose, desire, goal, preference, perception, attitude, and incentive all have their

place. Regardless of the particular word applied individually at any given moment, a person is likely to have a number of motives, drives, incentives, desires, wishes, and purposes operating at the same time. Whether they are consciously present or are unconscious, many of them act upon the individual simultaneously. It is therefore safe to expect a normal person to be in conflict some of the time. A child trying to decide between candy and ice cream is in conflict. An employee who wants to tell the boss off but also wants to keep his job is in conflict. An employer who must decide whether to sell an oversupply of a commodity at a loss or hold it a little longer is likewise in conflict. Furthermore, a decision once made does not necessarily resolve the conflict.

Drives or motives vary in strength not only from one individual to the next but within the same individual at different times. Sometimes the immediate goal is at cross-purposes with the distant goal, even though both are desirable. Of course if we could know all there is to be known about the various motives that operate both within the individual and from the outside and, further, if we could know the relative strength of these drives in him at the particular moment, we could predict behavior accurately. But since present-day knowledge in psychology has not reached this stage, predicting behavior is extremely difficult. The factory worker may work overtime or not, depending upon whether he believes he needs a rest, has a date, wants to "get in good" with the supervisor, needs the money for food or clothing, or works just for the sake of earning money. Intimately tied up with motivation are man's various emotions; so fear, anger, joy, or just no feeling at all will also enter into his decision on how to answer the boss's simple question: "Will you work overtime tonight?"

A man on a job never works in the vacuum of his job. Therefore, man's conflict in industry is just as real and just as complex as a conflict that a psychologist or psychiatrist studies in the office. The decision to strike, to quit the job, to ask for a salary raise, to talk back to the boss, or to argue with a co-worker rarely if ever results from a single motive, regardless of the fact that the employee, when requested to explain his actions, may give a single reason. Known or unknown to him at that time are the consequences of satisfying the various physiological needs and the social drives operating in the situation and in him.

Young people can be expected to act differently from old people; if they act in the same way, it is usually because of different motives which occupy different relative positions. Married workers will act differently from unmarried workers. Men will act differently from women on a job

because on the job they have different motives, or motives of different relative strengths.

The production manager of a large factory employing young women recently complained of the high turnover rate, despite the fact that job security was offered and the company had the proud record of never having dismissed a single employee for lack of work. In addition, it paid fair competitive wages and offered many inducements such as bonuses, music, good lunches for thirty-five cents, and other things. The company was considering the possibility of introducing psychological tests to reduce the labor turnover. In this case it does not appear that such tests would decrease the turnover to any appreciable extent. They might be useful in shortening the training period and thus be moderately helpful. Labor turnover here is a reflection not of the girls' ability or the company's practices; it is a function of the fact that this firm employs young women who have many reasons for leaving a job, including the possibility that they may have a greater desire to marry than to continue working. Perhaps hiring older women or men would reduce the turnover. This illustration is not to be interpreted as a bias for or against hiring young women. Since this factory is very successful despite its high turnover, it might be that a change in its personnel policies would create other problems such as modification of the wage structure or changes in the method of supervision.

### Overemphasis on Financial Incentives

In view of the complexity of motivation in man, it can be definitely stated that industry has overemphasized the importance of financial incentives. Some people believe that money is the only incentive in industry, and many believe that it is the most important incentive. (See Fig. 3.1.) This false premise and oversimplification have caused many of the best-laid incentive plans to fail. For example, the Wiremold Company of Connecticut concluded after a six-weeks drive that awarding war bonds to employees for perfect attendance was not the solution to the absentee problem. In announcing the discontinuation of the plan the president of the firm stated that the plan had failed to influence the habits of the employees because most of those who had been irregular in attendance before the award system was inaugurated were still irregular.

A bus slowdown in New York City was attributed by the third vice-president of the drivers' union to the drivers' refusal to work overtime. He said that the men were not seeking more money; they were tired and they
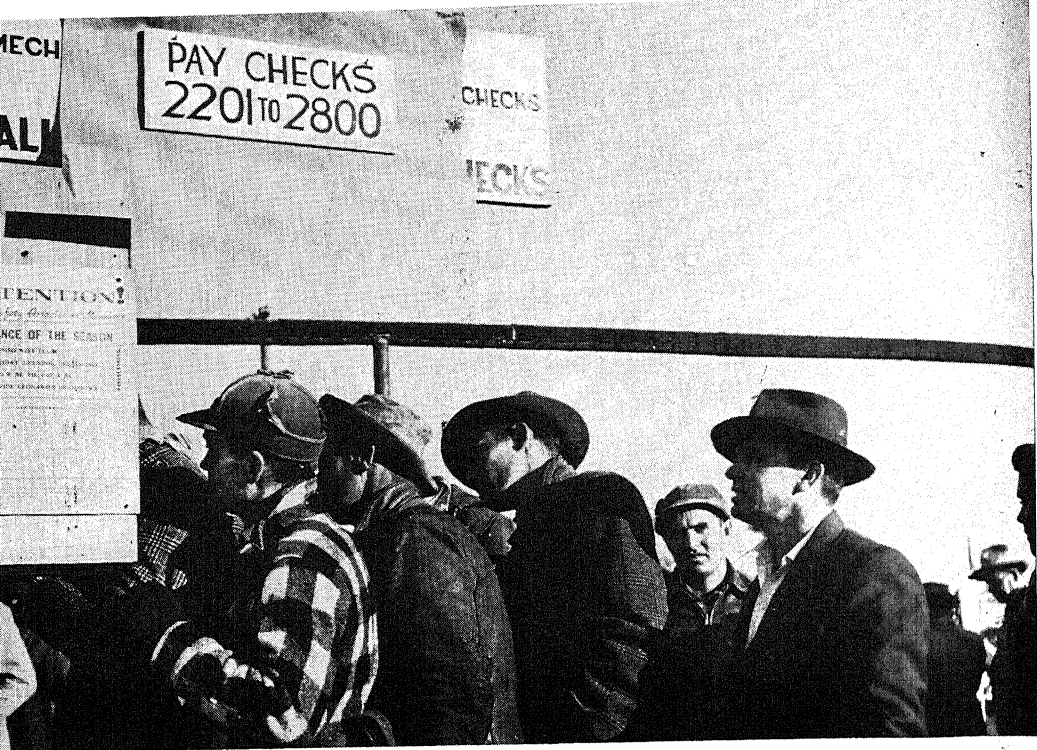
*Figure 3.1.* Payday for Employees Around the World. (Courtesy of Standard Oil Co. [N.J.].)

thought the company should hire additional drivers. Their average earnings were $3200 a year, an income which, according to most standards, cannot be considered very high.

Ever since Taylor's time the "experts" have been concocting one wage

Table 3.1. Classification of Financial Incentive Plans by Production-Earning Characteristics

A definite quality, quantity standard must be established and enforced as a prerequisite to any of these plans except I-1.

Class I. *Employer Takes All Gain or Loss*

1. Time: hour, week, or any straight salary rate. Not an extra-financial incentive.
2. Standard time using two rates, one either side of task. A two-zone multiple time plan.
3. Multiple time: arithmetic steps in rate between production zones. (Sometimes called standard time plan.)
4. Multiple time: geometric steps in rate between production zones.

Class II. *Employee Takes All Gain or Loss*

5. Piece or straight commission rate. This subdivides into punitive, basic, and high.
6. Taylor (Multiple piece rate or multiple commission).
7. Merrick (Multiple piece rate or multiple commission).
8. Gantt (Combination of No. 1 and No. 5 with step between). (Without step, it would be called piece rate with guarantee, Manchester, Standard Hour, 100% Premium or Haynes Manit. All five have identical earning curves.)

Class III. *Gain Shared Between Employer and Employee but Day Wage Guaranteed, excepting in Barth and "One-Third Premium" Form of Halsey*

9. Halsey.
10. Diemer.
11. Baum.
12. Bedaux, Dyer, Keays-Weaver, K.I.M., Shanley, and Stevens.
13. Ficker Time } (Awkward and unsound).
14. Ficker Piece } (Awkward and unsound).
15. Sherman Individual-Group (Awkward and unsound).
16. Rowan, Mansfield, and Bayle.
17. Barth (Particularly good for beginners).

Class IV. *Empiric Location of Points Between the Two Variables*

18. Emerson.
19. Wennerlund (Piece work or commission above 100% production).
20. Knoeppel.
21. Bigelow.
22. Bigelow-Knoeppel.
23. Parkhurst.
24. Ernst and Ernst.
25. Sylvester.

Table 3.1 is reprinted from C. W. Lytle, *Wage Incentive Methods*, rev. ed. Copyright, 1938, The Ronald Press Company.

incentive system after another, until now there are literally hundreds of such systems. One of the most comprehensive reviews of wage incentive plans is that offered by Charles W. Lytle (7), who believes that such plans are important in any cost production problem. According to him, incentive payments have two advantages: (1) an increase in production per unit and (2) an increase in employee earnings. He believes that the advantages of a properly selected, well-installed, and ably managed wage payment plan accrue annually to employees and employers. Of course, Lytle does not say that these advantages "accrue mutually and fairly," for they do not. As Mark Spade says in his brilliant book, *How to Run a Bassoon Factory,* wage incentive systems are a "means of paying employees more—but not so much."

From the point of view of the industrial psychologist, it is extremely difficult to differentiate among the various financial incentive systems. In some respects the only essential difference is who obtains the consulting fee. Lytle has attempted to classify all financial incentive plans on the basis of production-earning characteristics. His results, presented in Table 3.1, give an idea of the numerous systems that have been promoted.

Lytle suggests that certain plans should be used only under certain conditions. He briefly describes the plans and their use as follows:

*Plans Which Are Justified, for What, Why and How.*

1. Day Rate Plan with production records and promotion.
   For unstandardized work, permanent, or temporary.
   It is simple and about all that can be used.
   Management should eliminate unsupported time payment wherever and whenever possible.
2. Multiple Time Plan with high bonus steps.
   For upgrading employees formerly on day rates, also for group applications.
   It is strong at task point and simple at all points.
   It must be more carefully managed than a more elaborate plan.
3. High Piece Rate Plan—with or without a minimum guarantee, and with the time basis of computation.
   For repetition work, not involving expensive machine rates.
   It is the simplest and the most sound of all the plans.
   Equalization requires care as task per unit of time may not be evident.
4. Merrick Multiple Piece Rate Plan.
   For upgrading inefficient employees formerly on low piece rate.
   It is flexible, strong, and relatively simple for what it can do.
   Tables must be used for explanation and computation.
5. Gantt Task and Bonus Plan (a combination of Nos. 1 and 3 with step between).

For machine jobs liable to delay and where machine rates are high.
It provides security with strength.
The day guarantee may need watching.

6. Halsey (50–50) Constant Sharing Plan with Time Guarantee.
   For guessed-at-standards, no big machine rates.
   It gives a high wage through intermediate production efficiencies.
   Task or rate inaccuracy is less serious.
7. Halsey (40–60) Constant Sharing Without Time Guarantee—up to 70 or 75% of high task.
   For beginners, skilled work.
   It compromises for low efficiencies.
   It is simple to understand.
   This plan is not recommended above task.
8. Bedaux Point Plan.
   For strongly centralized management and for widely diversified operations.
   It gets results through its production control rather than through improved operations and high rates.
   It involves a lot of figuring.
9. Barth Variable Sharing Plan—up to day wages only.
   For beginners, unskilled work.
   It gives a high wage for low production efficiencies without any guarantee.
   Tables must be used, the new employee may not have a slide rule.
   This plan is not recommended above task.
10. Emerson Empiric Scale Plan—between 70 and 100% task only.
    For gradual transition from day work plan to high piece rate plan.
    It avoids the abrupt step and may be justified in some cases.
    The empiric principle is only used within the above limits, and outside of these, other plans are preferable.[1]

The financial incentive systems have been overplayed. They do not work as effectively as they are assumed to. The Bank Wiring Observation Room experiment in the Hawthorne plant showed clearly that restricted rather than unlimited production characterized the workers. In his book *Salary and Wage Administration* (5), Ralph W. Ells says: "Fortunately for both management and labor more and more companies are discouraging plans based on fixed standards in favor of plans based on competition between employees or groups of employees. It is only a question of time before all incentive programs will provide real incentives and will keep employees striving to improve." After drawing a sound case for incentives

[1] From C. W. Lytle, *Wage Incentive Methods,* rev. ed. Copyright, 1938, The Ronald Press Company.

based on group coöperation, he concludes: "If more companies would establish a sound salary and wage structure and adopt an annual program for distribution of abnormal profits there would be fewer personal failures, fewer problems for executives and a better distribution of salaries and wages."

The present author believes, as has already been brought out, that not only has the financial incentive plan been overdone but in many cases the financial award has not even operated as an incentive. There is no doubt
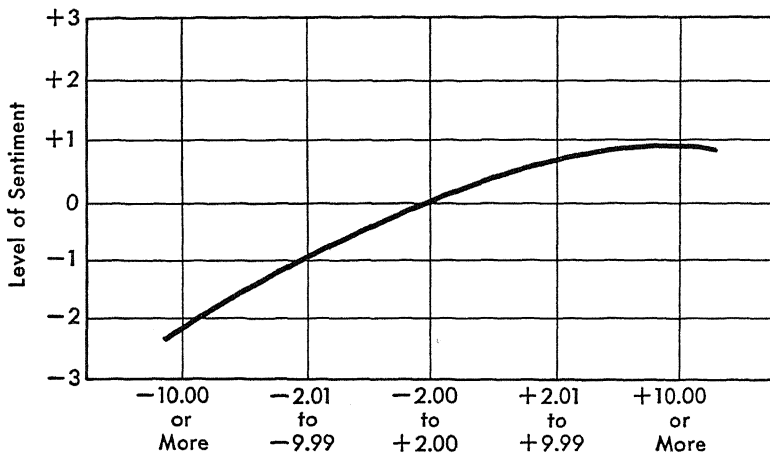
*Figure 3.2.* Relationship Between Level of Sentiment and Starting Wage Rates Related to Previous Salary. (From L. O. Stockford and K. R. Kunze, Psychology and the pay check, *Personnel* [1950], 27:129–143.)

that employees and employers need money, if for no other reason than that it is the recognized medium of exchange. However, just how much a person needs is a subject for much speculation. Money is a necessary thing, but only in some instances does it operate as an incentive. Some people can just get along on $2500 a year, others on $5000, and still others on $10,000. Although the low-income group does not appreciate the financial problems of the high-income group, both have such problems, problems that from their respective points of view are of the greatest intensity to both groups. It is not a question of which is right or wrong. Money is needed for food, clothing, shelter, medical care, education, luxuries, social position, and power. Even when people desire money out of proportion to the amounts specifically desired by others, the existence of their need cannot be denied. The power drive, and the belief that money is a source of

power, can be just as real a need to one person as the need for money to obtain food is to others. Furthermore, the amount needed for food varies according to size of family, living habits, etc. We cannot talk of the need for subsistence on an absolute basis because too many variables are involved.

Stockford and Kunze (*12*) report a study in which the results suggest that the value of wages is relative and not absolute. They compared the attitudes of workers and starting salaries in relation to salary on the previous job. Figure 3.2 presents the results, which indicate that employees with the same starting salary may have favorable or unfavorable sentiment toward the company. "Unfavorable" starting wages (i.e., less than previous wage) exert a persistent and detrimental effect upon sentiment toward company, employment stability, and performance. The negative attitude is significantly more intense than the positive attitude resulting from "favorable" starting wage rates.

### Kinds of Incentives

Incentives may be classified "financial" and "nonfinancial," but it seems more desirable to classify them as "competitive" and "coöperative." In both education and industry, the values of incentives based upon coöperation are beginning to be realized. Organizing people into meaningful groups and having them work together toward a common goal results in more learning at the educational level and greater production at the industrial level. The reports of various companies bear out this statement (see Chapter 8).

The term incentive is used for a spurring force that is introduced as a means of achieving a goal. An incentive bolsters activity in the direction of the goal. An individual may introduce his own incentives, in which case they are extremely meaningful. However, in industry, the incentive is often used as a means of spurring on an employee toward someone else's goal. He may not be interested in either reduced costs or increased production but he may be persuaded to achieve this goal by an incentive. When the incentive results in satisfaction for the employee, and the achievement of the goal results in equal satisfaction for the employer, the plant is being successfully operated. The major difficulty with financial incentives has been the fact that the additional money has not meant as much to the employee as the employer assumed it would. The outstanding reason for employee objections to such plans has been the fear of a rate cut. This fear is present, regardless of whether it is justified or not. There

is also the fear of a layoff; and so the worker does not respond to the magic of a financial incentive to the extent that the Gantts, Merricks, Emersons, Diemers, Barths, and many of its other proponents would have us believe.

Both competition and coöperation may in themselves be regarded as incentives. Competition calls for one individual to do better than the next individual. Coöperation calls for people to contribute equal and maximum efforts toward a common goal. Competition and coöperation are not mutually exclusive, especially when individuals coöperate in groups to compete with other groups. Industry in the past has placed too much emphasis upon competition; only recently have the advantages of coöperative behavior as an incentive been recognized. The use of coöperation as an incentive holds considerable promise of success.

In the mind of the employee a minimum of five drives are likely to operate on the job. In alphabetical order they are: advancement, hours of work, salary, security, and supervisor relationships. A study conducted by Blum and Russ (*1*) attempted to determine the relative importance of these five incentives. The data were obtained from a group of 286 gainfully employed people ranging in age from 17 to 60 years, and in occupation from unskilled manual labor to the professions. There were 181 men, 72 of whom were married, and 105 women, 26 of whom were married. All the subjects lived in the New York City area.

The questionnaire used in the study is shown in Figure 3.3. An examination of it reveals that each of the five incentives is compared with the other four. Actually, this results in ten comparisons. Each time one incentive is preferred to the other in the comparison, a score of 1 is assigned to it; in other words, a maximum of 10 points is distributed among the five incentives. Consider, for example, the following score:

| | |
|---|---|
| Advancement | 3 |
| Security | 3 |
| Salary | 2 |
| Supervisor | 1 |
| Hours of work | 1 |

This score means that the individual checked salary twice out of a possible 4 comparisons, advancement three times out of a possible 4 comparisons, etc.

The subjects in this study were told to answer the questionnaire as it applied to their own feelings rather than to any general attitude. The pur-

Sex..........Age..........Married or single....................

Title of present job..........................................

*Circle number applying:*

How many jobs have you held?
1 2 3 5 8 10 More than 10

How many years have you been employed?
1 2 3 5 8 10 More than 10

How many years with present employer?
1 2 3 5 8 10 More than 10

How many employees in present firm?
5 10 25 50 100 More than 100

In the following list, please check one item in each pair which you consider more important to you in a job. There is no correct or model answer. Each answer is indicative of your attitude.

.......Receive more pay and have an insecure job, or
.......Receive less pay and have a secure job.

.......Have a friendly supervisor and work more hours, or
.......Have an unfriendly supervisor and work fewer hours.

.......Receive more pay and have no advancement possibilities, or
.......Receive less pay and have advancement possibilities

.......Have a secure job and work more hours, or
.......Have an insecure job and work fewer hours.

.......Have a friendly supervisor and no advancement possibilities, or
.......Have an unfriendly supervisor and have advancement possibilities.

.......Receive more pay and have an unfriendly supervisor, or
.......Receive less pay and have a friendly supervisor.

.......Have a secure job and no advancement possibilities, or
.......Have an insecure job and advancement possibilities.

.......Receive more pay and work more hours, or
.......Receive less pay and work fewer hours.

.......Have a secure job and an unfriendly supervisor, or
.......Have an insecure job and a friendly supervisor.

.......Work fewer hours and have no advancement possibilities, or
.......Work more hours and have advancement possibilities.

Interviewer.....................................

*Figure 3.3.* Attitude Questionnaire. (From M. L. Blum and J. Russ, A study of employee attitudes towards various incentives, *Personnel* [1942], *19*:438–444.)

pose of the questionnaire was not discussed with any subject prior to his completing it.

Although the number of subjects was small, and therefore the interpretations and conclusions may be in error because of the limited sampling, repetitions of this questionnaire have yielded similar results (as yet unpublished). The results of this study are presented not so much to indicate absolute findings as to illustrate the possible uses to which this questionnaire can be put.

The total sample was divided into thirds on the basis of when the completed questionnaires were returned by the interviewers. From Table 3.2 it appears that not only are the ranks of the various incentives similar but only slight differences in the averages exist.

Table 3.2. Average Score of First and Third Groups

| | Salary | Security | Supervisor | Hours | Advancement |
|---|---|---|---|---|---|
| First third | 1.64 | 2.75 | 1.36 | 0.82 | 3.43 |
| Third third | 1.76 | 2.66 | 1.31 | 0.82 | 3.48 |

The attitude of men and women toward the various incentives is shown in Table 3.3, as an average score on each incentive for the two groups. In addition, the number of times a particular incentive was preferred is shown as a percentage of the total obtainable for that incentive. An analysis of these figures indicates that the two sexes tend to agree as to the relative importance of the various incentives. The single exception is the women's rating of supervisor ahead of salary; for the men this is reversed. Both groups rate advancement and security in first and second place and agree that hours of work are least important. The men consider advance-

Table 3.3. Scores and Percentages for Each Sex on the Questionnaire

| | Men | | Women | |
|---|---|---|---|---|
| | Score | Percent of Total Score Attainable | Score | Percent of Total Score Attainable |
| Salary | 1.84 | 46 | 1.43 | 39 |
| Security | 2.77 | 69 | 2.86 | 72 |
| Supervisor | 1.33 | 33 | 1.79 | 45 |
| Hours of work | 0.59 | 15 | 0.86 | 21 |
| Advancement | 3.47 | 87 | 3.06 | 76 |

ment and salary much more important as incentives than the women do. But supervisor relationship is more important for the women than for the men. Security and hours of work are not statistically differentiated within these groups.

A further analysis was made on the basis of marital status, the results of which are shown in Table 3.4. We find that both the married men and the

Table 3.4. Attitude Toward Various Incentives According to Marital Status

| | Men | | Women | |
|---|---|---|---|---|
| | Married | Single | Married | Single |
| Salary | 46% | 46% | 34% | 36% |
| Security | 76% | 65% | 65% | 73% |
| Supervisor | 32% | 34% | 51% | 45% |
| Hours of work | 13% | 16% | 29% | 18% |
| Advancement | 83% | 89% | 71% | 78% |

single men attach approximately the same importance to salary, supervisor, and hours. Security is more important to the married men, and advancement is more important to the single men. The women show no statistically significant differences among the various incentives with the single exception of hours of work; the married women attach greater importance to working fewer hours than do the single women. The married men emphasize security more than the married women do, and security is more important to the single women than to the single men. The married women attach greater importance to the supervisor than do the married men; this difference is seen also in comparing the single men and women. Attitude toward salary is unaffected by marriage, a finding similar to that reported by Cole (3). The married men care least about the number of hours worked, and the married women care most; no difference is observed between the single men and women. Advancement is more important among the single men than among the married men; this is also true for women.

Inasmuch as attitude toward work may be a product of age, the two groups were separated into the following age categories: less than 20, 20 to 29, and above 30. Table 3.5, which presents the results of this analysis, indicates that the group over 30 is less interested in advancement than are the younger groups; this is true for both sexes. This group also places greater emphasis on security than do the younger groups, and attaches

Table 3.5. Age and Attitude Toward Various Incentives

| | Men | | | Women | | |
|---|---|---|---|---|---|---|
| | Less Than 20 Years | 20–29 Years | 30 Years and Above | Less Than 20 Years | 20–29 Years | 30 Years and Above |
| Salary | 43% | 47% | 45% | 39% | 39% | 37% |
| Security | 72% | 65% | 78% | 71% | 70% | 77% |
| Supervisor | 38% | 32% | 33% | 46% | 48% | 42% |
| Hours of work | 10% | 17% | 13% | 17% | 20% | 27% |
| Advancement | 88% | 89% | 81% | 78% | 78% | 67% |

less importance to the supervisor relationship. The women, as they grow older, are more interested in working fewer hours. It is to be noticed that salary remains relatively constant for both sexes regardless of age.

The data on the number of jobs held and the years employed were analyzed; the results were very similar to those obtained on the basis of age. Naturally, the older a person is, the greater the opportunity for more jobs and longer service with an employer. However, a much larger group of subjects would be required before we could definitely determine whether there actually is this close relationship among jobs held, years employed, and age.

The study also analyzed the attitudes of the two groups in relation to the total number of employees in the firms where they worked. A comparison of the attitudes of people who work for a firm with less than 5 employees and those of individuals in companies with 100 or more employees shows that the latter rate advancement as much more important than do the former. The supervisor is much more important in small firms. The other three incentives are rated alike by both groups.

To summarize, this study measured the attitudes of employees toward five incentives by the paired-comparison technique. It found that advancement and security were the two most important incentives, with hours of work the least important. Salary was rated third by the men and fourth by the women. Supervisor relationship was ranked fourth by the men and third by the women. Married men considered security more important and advancement less important than did the single men. The married women were more interested in working fewer hours than were the single women. The significance of advancement as an incentive decreased with age for both sexes, and security became more important with age, but advancement and security were considered more important than

salary. The attitudes of employees changed in relation to such major classifications as sex, marital status, and age.

Jurgensen (*6*) had a group of 150 female and 1189 male applicants for positions at the Minneapolis Gas Light Company complete a job preference questionnaire. Each subject was asked to rank ten items in order of preference. The mean rank for each of the items is presented in Table 3.6.

Table 3.6. Job Preferences of Men and Women Applicants (6)

| | Mean Rank | |
|---|---|---|
| Sex: | Men | Women |
| Number: | 1189 | 150 |
| Security | 3.1 | 4.7 |
| Advancement | 3.4 | 4.5 |
| Type of work | 3.7 | 2.8 |
| Company | 4.6 | 5.0 |
| Co-workers | 6.1 | 5.6 |
| Pay | 6.3 | 6.5 |
| Supervisor | 6.3 | 5.2 |
| Hours | 6.9 | 6.3 |
| Working conditions | 7.3 | 6.2 |
| Benefits | 7.3 | 8.2 |



Jurgensen found that job preferences were affected more by extent of education than by most other variables. Advancement became more important and security less important as education increased. Jurgensen concludes that management and labor leaders err in statements and demands with regard to job applicants' preferences. According to his findings, wages, hours, and working conditions are not so important as is generally thought, and type of work is more important than is ordinarily stated.

Stagner (*11*) reports a study based upon 7000 employees of a nationwide corporation. The results are presented in Table 3.7. After reviewing various researches, Stagner concludes "that neither executives and workers are concerned about pay as such, except when economically pinched. At other times they prefer ego-satisfactions such as prestige, power, recognition, security and treatment as an individual."

A pause to compare the results of Blum and Russ, Jurgensen, and Stagner is desirable. Although different methods were used, and the studies

Table 3.7. Ratings of Importance by Workers on Various Job Factors (*11*)

| | % of 7000 Workers Including This Item in the First Five | First Choices Only |
|---|---|---|
| A steady job | 61.9% | 36.1% |
| Pay rate | 52.6 | 7.2 |
| A chance to get ahead | 41.9 | 6.9 |
| A square boss | 39.6 | 4.8 |
| Working on the job you prefer | 35.3 | 15.2 |
| Credit for the job you do | 29.6 | 2.2 |
| Vacations and holidays | 21.5 | 0.4 |
| Friendly working companions | 21.3 | 0.7 |
| Medical and health facilities | 20.8 | 0.6 |
| Pension | 9.7 | 7.1 |

included different complexions of sampling, the results tend to be more similar than dissimilar. The findings substantiate the view that salary is not the most important factor on a job, nor does it operate as the all-powerful incentive. It follows that appealing to stronger motives for work will result in more highly motivated workers.

The views of Harold Ruttenberg (*9*) are interesting in this connection. Although unions are often believed to have as their single purpose the obtaining of more money for their members, they may satisfy the employee's tremendous need for self-expression. Ruttenberg, who was formerly Research Director of the Steel Workers Organizing Committee, emphasizes this need when he says: "The urge for a means of self-expression is usually present in every individual in an industrial plant, and consciously or unconsciously (usually the latter) each individual constantly seeks some way to express himself." In his experience in industry, he has found the need for self-expression to be a basic incentive, as important as the desire for economic betterment and personal security, and in some instances even more important.

The Survey Research Center of the University of Michigan has conducted some studies on the relationship between productivity, supervision, and employee morale. In connection with the study done in an insurance company it is stated (*10*):

> People are more effectively motivated when they are given some degree of freedom in the way in which they do their work than when every action is prescribed in advance. They do better when some degree of decision-making about their jobs is possible than when all decisions are made for them. They respond more adequately when they are treated as personalities than as cogs in

a machine. In short, if the ego motivations of self-determination, of self-expression, of a sense of personal worth can be tapped, the individual can be more effectively energized. The use of external sanctions, of pressuring for production may work to some degree, but not to the extent that the more internalized motives do. When the individual comes to identify himself with his job and with the work of his group, human resources are much more fully utilized in the production process.

### Why People Work

Life, whatever it is, can be characterized as activity, and during the course of it people are continually active, even when they sleep (everyone turns and moves during a normal night's sleep). Work is a form of activity that has social approval and satisfies a real need of the individual to be active. To produce, to create, to gain respect, to acquire prestige, and incidentally to earn money—these are some of the reasons why people work. The paycheck must mean many different things to different workers (see Fig. 3.4).

In our society there are few instances of forced idleness; but when they occur, they are usually characterized by unpleasantness. People in jails or hospitals and the unemployed are examples of forced idleness. Almost everyone in jail wants to get out; even the hospital patients who have all their wants attended to and who receive tremendous attention from attractive nurses, besides their family's overabundant concern, still yearn to get back on the job. Similarly, the average worker waits an entire year for his two-week vacation and plans how he will do nothing but rest. In some cases the vacation results in a need for a real vacation, but the employee handles this somehow when he is back on the job—within a month he is making plans for resting up on his next vacation.

In 1935 Sidney Roslow conducted a survey on the attitude of 98 relief workers toward work relief or home relief. Although the money received by these two groups of people on relief differed, by no stretch of imagination could either be regarded as financially affluent. Everyone in the entire group preferred work relief to home relief because it allowed him to maintain his self-respect. Only 3 percent based their preference on the fact that work relief paid more; 43 percent preferred it because of the effect it had on their morale, and 50 percent preferred it because they were paid for working or they preferred working to being idle.

Many theories have been advanced to explain work. The Gilbreths believed that work could be made pleasant. Henry Ford, on the other hand, believed that it was basically unpleasant and that therefore the hours of

*Figure 3.4.* Do People Work for Money Only? *Top:* The mechanic has just been paid. *Left:* Arabs fingerprint the payroll receipt and pick up their silver riyals. (Courtesy of Standard Oil Co. [N.J.].)

work should be as short as possible and the pay as high as possible.

The author has been successful in stumping his classes over a period of years by requesting them to differentiate between work and play. Is a major league baseball player, or a man who plays this game on his only day off, working or playing? Is a business executive entertaining an important customer at a night club at work or at play? Is an amateur fisherman who gets up at 3 A.M. to go fishing at work or at play?

Nor does an attempt to differentiate between work and play on a monetary or voluntary basis help. Is the volunteer nurse at work or at play? Forced or required activity for which one does not receive pay may be work, but it also may be play. When a psychologist mows the lawn under a hot sun because the lawn needs attention, he is a gardener; but is it fair to say that the gardener and the psychologist are both working? Of course there are differences between work and play, but in many instances the only difference is in the attitude toward the activity or the label attached to it.

We must recognize the important values which are attached to the many needs expressed and fulfilled in work. Mastery of the job and the importance of self-expression are two such values. The Studebaker Company's advertising plays up the individual pride and sense of responsibility in its workers, and proves the point by means of father-and-son teams, like that shown in Figure 3.5. Along the same line is this little story told by Bob Burns:

> If you want a job done well, give it to a man that takes pride in his work. You may have to wait a little longer for it, but when you get it, it'll be done right. We've got an old tailor down home that has the reputation of being the best pants maker in seven counties, but you can't rush him.
>
> A traveling man heard of his reputation one time, and while he was in town he ordered a pair of pants from this old tailor. The salesman left town and came back in two weeks and called up the tailor and the tailor says, "Your pants ain't done yet but I'm workin' on 'em." A month later the salesman came back to town and his pants wasn't ready yet.
>
> Finally on his fourth trip he dropped around to the tailor's shop and found the old tailor had just finished the last stitch. The salesman was pretty mad. He turned to the tailor and he says, "It took six days to make the world and it took you eighty days to make these pants!" The old tailor said, "Yes, but just take a look at the world and then take a look at them pants!"

Few people are able to continue a job that they regard as meaningless or that they really know they cannot do well. Near a certain station of a railroad there is a gatetender whose job is to lower the gates when trains

*Figure 3.5.* Pride and Responsibility in Work. (Courtesy of the Studebaker Corporation.)

pass his station. It is with considerable pride that this man, day in and day out, lowers the gates and then stands where he can see the engineer. His behavior is so routinized that in many respects it is compulsive. When a train is a certain distance away he starts to wave with a large circular motion, and the expression on his face changes from pleasure to delight and finally to sheer ecstasy. When the engineer comes alongside him his hand is upraised and his face is beaming; anyone can see that this man enjoys his job. Apparently the engineers enjoy his antics too, because they toot their whistles out of all proportion to safety needs; each one responds to the greeting in his own way. This man is very different from most gate-tenders, who regard each passing train as an interference with peaceful slumber and each engineer as a nuisance.

Tell the man who is polishing automobiles or drawing intricate plans for a house that he has done an excellent job and he will find reward in his work. Mastery of the job and pride in successful accomplishment are real reasons why people work and work hard. This applies to all jobs that are recognized as jobs, regardless of where they stand in the social hierarchy. The bus boy hopes some day to be a waiter; therefore he likes to work with a waiter who will give him a chance to learn. The plumber's

helper wants to be a master plumber, and the college instructor wants to be a full professor.

Although there are not many case studies of the average, typical, normal worker, the few that have been made indicate that the financial incentive does not play an overwhelming role in a man's working life. Prestige, social acceptance, pride in work, self-expression, and the many related social drives are all equally or even more meaningful. An interesting book entitled *Seven Shifts*, edited by Jack Common (4), describes the life and work history of seven ordinary Englishmen: a plasterer, a steel worker, an unemployed man, a gas worker, a market man, a blast furnace man, and a railroad worker. To read these industrial autobiographies of average-typical-menial-marginal workers is to become convinced that money is not the most important incentive to a worker. A workingman does not separate his living from his working life. He is a human being embodying many motives and conflicts, and his behavior is as unpredictable on the job as it is in life. These seven people have written autobiographies emphasizing their work experiences and attitudes. Although each story is very different from the others, all have a common core in that they describe part of that large group of people known as employees. Wisely enough, no attempt has been made to type workers on the basis of these seven autobiographies.

Jack Hilton, the plasterer, is a man who takes great pride in his work. As he puts it, "Plastering is essentially human and it makes its tradesmen human. Our material comes from Mother Earth and we use it with skill and muscle. Relative to men on other occupations we may appear primitive. That is our good fortune. . . . We get the satisfaction that we have really done something; something that a machine hasn't done; something that has called for greater patience, ingenuity and skill than a four-minute job."

According to Hilton, the plasterer is proud of his long trade-union history. He is proud of doing a job well, is skillful, and knows how to be adaptable. Furthermore, his work, his employers, and his fellow employees give him variety. A job usually lasts from six to ten weeks, and when it is unpleasant he has the consolation of knowing it will be over soon.

In speaking of his work's disadvantages, Hilton mentions the time lost because of slack periods and bad weather. He also dislikes the long and costly trips to and from a job. The common menace faced by all plasterers is the lime in the materials which sometimes gets into the eyes.

The plasterer has a higher status than the laborer and he shows this superiority in many ways. With respect to the plasterer's relation to the guffer (boss), Hilton writes, "I can work harder for a guffer that is a decent sort and leaves the job to me than for one who is never satisfied and is always coming around trying to pull a bit more out of me." At times the men will compete vigorously with one another and work at a terrific pace. They shout "Stuff, stuff, stuff" and use it up as fast as the laborers can bring it. Finally one of the men will capitulate, whereupon they return to a more normal work pace in which they do not try to "murder themselves."

Hilton is not necessarily a typical plasterer, but he is typical of a man who is proud of his work.

James Stirling is a very different person. He had a job in a steel mill and was preoccupied with the dangers in the rollers and other machinery in the mill. He had a strong dislike for the fumes, dirt, and primitive work conditions. Finally thrown out of work because of a slack, he held a series of jobs, such as knocking bricks from a kiln, working with a barrow, operating a crane, and doing clerical work.

Stirling is rather bitter about the depression and its effect, and also about management experts. He writes, "Trainees drift through large workshops in two years or so, spending a month here, six weeks there, going over every department, learning 'workshop control,' developing themselves to be managers sometime in the future. They are probably decent lads, but they don't know a damn thing when it is all over that this or that scrub worker at fifty shillings a week cannot do with his eyes shut and without thinking."

Will Oxley, the unemployed man, tells a vivid and lurid story of what goes on inside a man when he has no work over a long period.

Herbert Mannion has a job in a "gas works" but apparently his basic motive is the desire for drink; work is merely an interlude between consuming a pint or so. He is pessimistic and somewhat fatalistic about his work: "So it goes on—until a slump sends me to the dole and the Means Test, accident to the hospital or early old age dumps me on the scrapheap. Whichever of these finishes my working career, I shall end up with nothing in the bank and not so much as a thank you from the people who have profited by my labour. You all come into the world with nothing and you can't take anything out. Well, that's a working lad's life, anyway."

Simon Blumenfeld, who operates a stall in a market, is aware of the ills

suffered by minority groups. He tells about the practical jokes that are played on these people and their ways of adjusting to the situation. He is aware of the "social and racial groupings" that gravitate to certain occupations as the line of least resistance. He does not consider the life of a small trader a happy one. According to him, "If the small trader could be profitably absorbed in industry, this would probably be a good thing for everyone concerned. He works longer hours than most of our craft unions would allow, and becoming more and more the rule, draws less money than the lowly salaried worker at the end of the week." He must hang on because, even if he was once a craftsman, he cannot go back to his trade, and a job as a shop assistant is closed to him because these positions are usually filled by young people.

J. H. Watson, who works in a blast furnace, is a "strong and cursing man" who has little respect for anyone who does not sweat while he works. In describing the process that leads finally to the tapping of the molten iron, he writes, "No doubt this sounds very dull but I can assure those people who have never seen a blast furnace, that I have worked on one for a dozen years and assisted at two or more tappings a shift, and I still get a feeling of awe, sometimes a mood of exhilaration, when we tap." He is dissatisfied with his inadequate and primitive living quarters and is concerned about the many evil manifestations of the power of money. He believes that the man who lives next to a cesspool is more precious than the man who condemns him to live there. He considers the laborer an outcast who smells a bit, but he regards the remainder of society as dependent upon his existence.

T. A. McCullock, a fireman on a railroad, counts himself one of the lucky ones because he has had no unemployment, receives steady pay, and each year is given three free passes for travel. He admits that he gets tired of the monotonous regularity of railway work but he still believes the day he applied for the job was a lucky one.

He is most concerned with what the other workers think. Warnings and fines hurt because their recipient feels that his prestige among his fellow workers is lowered. As McCullock says, "The worker always has his pride in being equal to his job. The company, of course, is just his natural enemy. He could evade the company's watch on him and be comfortably inefficient. But he can't escape his mate's opinion of him. His mates don't object to him drinking while on duty; they don't care if he steals from the company. Damn good workers do both."

McCullock is critical of leadership but believes that it does no good

to blame it because the self-styled leaders have no clear mandate. He thinks that the general view of employees is that the dumber they are, the better, and that brains and imagination are discouraged. "Most of the time we'd be content to let the self-styled clever folk carry on, provided they left us a loop hole to be free in. For it's a big job to be responsible for, and we know too much about jobs in general to rush at one before we have some idea of how it should be done."

Another illustration is afforded by quoting a delightful essay in a column by William Chapman White (*14*). The man he refers to is probably not too highly motivated by any incentive which is extraneous to his way of life.

### BIRD OF $5 PASSAGE[2]

He came to the front door and said: "Your garden could use a good weeding, if you'll excuse my saying so." No one argued that. "I'm a gardener," he added, "and I'm looking for work by the day. How about it?"

He was a tall cadaverous man past sixty, as thin as a flower stalk. To judge from his appearance he wouldn't last an hour in the hot sun. He wore the oldest of felt hats and a coat sweater over a flannel shirt that had been washed so often that it had faded to the palest gray. In spite of that costume, he managed an air of elegance, slightly bored, the air of a man who had been everywhere and seen everything and wasn't the slightest impressed.

Because the weeds were high he was hired. Not only did he survive the first four hours in the sun but he did as much work as any two men might be expected to do. The weeds were out, and neatly raked soil showed where he had passed.

As he rested for a few minutes in the afternoon he pointed to a robin. "I'm like one of those birds. North in summer, as far north as I can get. I spend my winters in Florida—" and he made that sentence sound as if he traveled there by his own ninety-foot yacht.

"I don't go to Florida directly, but I stop here and there, the same way I come north. I work at a place until I have $5 for bus fare and $10 cash in my pocket, then I move on. I keep out of the big cities—that's where you get into trouble. I work a little while in Jersey or Maryland and then in Virginia, the Carolinas, and on to Florida, and I keep going as far as I can get, right to Key West. In the spring I head north the same way. I used to go east and west the way I now go north and south, but that's too long a distance at my age. It takes too long to get where I'm going, even though where I'm going's never very important."

He refused a cigarette. "Cuts my wind for my journeying, I find. And, mister, I've journeyed. There's no place in America I haven't been. You name any town, and I'll tell you the name of its main street. Bismarck, North Dakota? That

[2] Copyright, 1954, New York Herald Tribune Inc.

would be Main Street. Dover, New Hampshire? Central Avenue. Corpus Christi, Texas? Broadway."

He picked up the rake and looked over the garden. "I'm a gardener because I like plants," he continued. "But I've been many other things. When I hit a place I look for gardens, and if no one wants me I take any job I can find. I guess I've had more jobs in my time than most anybody. I've tended horses on a fancy ranch in California and took care of a sick man for three days in Bisbee, Arizona, while his wife went off to care for a sick mother. I've sold tickets to a roadside zoo below Palm Beach and worked with a popcorn stand in a carnival until the wife of the owner got mad at him one day and slipped in cold cream instead of butter."

He grinned at that. "I was companion to a sort of sick man once, and the family paid me $300 to stay with him, but he paid me $500 the next day to quit, so I quit, but I paid back that first $300, of course. I've helped trap eels, and I worked for a lady once in Jersey tending a little lawn where she docked me a dollar if she found a weed.

"I've never owned a thing in my life but my clothes, and never wanted to. I guess it all doesn't add up to much, but it adds up as much for me as for any bird like that robin, except they come north to raise a family, and I've not even bothered with that and don't miss it none."

After the third day of work he asked to be paid. He said as he left: "See you in the morning."

He didn't show up the next day nor ever again. His story would be unfinished if a neighbor hadn't happened on the end of it.

"I saw him on the bus north the other night," the neighbor said. "He attracted my attention because I heard him say at the bus ticket window: "Mister, how far north can I go for five dollars? That's where I want a ticket to."

These eight ordinary working-class men are just as human as everyone else. They differ in their jobs and their motives and their way of life. None of them believe that they are dumb; they are critical, sometimes even contemptuous, of those who "run the show." They do not really want to take over the functions of these others, but they do want a chance for self-expression and they feel a crying need to be understood.

The case study approach to the problem of the motivation of people in industry can lead to productive results and better understanding. Although efficiency systems often assume that there are short cuts in motivating people, there are none that are worth while.

## An Overall View of Motivation and Work

Morse, Weiss, and Griggs (8) report after a survey that work has a double function. Gainful employment enables people to get money to support their families and themselves. Work also relates to society. It

gives people a feeling of "place" or "role." In other words, work not only allows a person to exist but tends to stabilize his place in society.

The "place" or "role" that a worker perceives is determined not only by individual values, drives, motives, and sentiments but also by the manner in which the worker relates to his group. A man at work, regardless of his job level, is part of a social structure in and outside the plant, factory, or office. He is a member of an informal group of colleagues or co-workers and possibly a member of a formal group. He is also part of the company structure. Some organizations already recognize this and encourage feelings of group identification with the company. See, for example, Figure 3.6.

Relations with co-workers, supervisors, and community may often influence what motivates a person to produce or restrict production, remain on the job or leave, or absent himself from work. These social forces may be as strong or stronger than certain isolated incentives offered by management which are interpreted by the worker as "out of context."

Too often the motive to increase production is management's and not the worker's. When the incentive to increase production is perceived differently by labor, then it does not work or it is only temporarily effective.

A bowling team may promote socialization. The employer who believes that employees will produce more because they can bowl may be making an unwarranted assumption. The workers may accept the bowling opportunity as offered and believe that it has nothing to do with producing more. Chances are if management indicated that only those who produced more could bowl, then many workers would not accept the recreational activity. In other words, bowling may be interpreted by both employer and employee as a good-will gesture.

This narrow illustration may well serve as the nub of the problem. Management's goal and employees' goal may be perceived differently, and when this happens, the two groups will also perceive a specific incentive differently, as operating toward each one's particular goal.

To effectively understand employee and employer, we must start with a knowledge of the complexity of motivation and the ways in which motives differ for different people. Age, education, marital status, and the host of personal characteristics also contribute to the different meanings that certain incentives have.

An understanding of motivation will contribute knowledge to the way a person perceives his role in society. By further understanding his attitudes, job satisfaction, and the way he relates to his work group, we

ure 3.6. Lockheed Employees Get Free Flights. They fly in the end product they helped build. (Courtesy of Lockheed Aircraft Corp.)

can then begin to approximate a meaningful perspective on the variety of problems confronting man in his workaday world.

It is misleading to talk about motivating workers without specifying the source as well as the goal of the motivation. Optimally effective motivation may require a unity of employer and employee sources and goals of motivation. This unity may exist only in Utopia. A most effective worker motivation may be impossible if the goals of employer and employee differ. This would mean that motivating employees according to employer goals may not always work. If the prime consideration is to most effectively motivate employees, then management may have to relinquish some of its own goals.

It is highly probable that maximum job satisfaction may actually interfere with maximum potential production. It is possible that maximum satisfaction cannot occur when one works intensely and at a forced pace. It may well be that when top production is desired, job satisfaction at the moment may be less than optimal.

Goals must be perceived as short-term and long-term. A short-term goal of high production may be achieved under certain conditions of motivation and at the same time vitiate a long-term goal of high production. Chances are the "gimmicks" fail in the long run because an achievement of a short-term goal was mistaken for that of a long-term goal. One of the major difficulties with industrial psychology is that the measures of production, training effectiveness, turnover, etc., may be indicative of immediate effect rather than long-term accomplishment. What is needed is more clear-cut understanding of long-term goals and objectives and how to achieve them.

Short-term goals are most likely to be effective when they reinforce and lead to the satisfaction of long-term goals as well. Short-term goals may be only temporarily effective when they have no relationship to long-term goals. Under certain circumstances the short-term goal may be in conflict with the long-term goal and yet operate for a short time. The success of short-term goals may need continuing and ever-increasing reinforcement. Some of the difficulties with incentives in industry is that the long-term goal of the employer when offered to the employee is perceived as a short-term goal. After the employee has experienced the clash between this goal and his own long-term goal, the short-term goal is no longer effective.

No attempt will be made to list short-term and long-term goals of employers and employees. Such a listing would be erroneous and would

limit thinking and experimentation. Probably long-term goals vary from person to person and even in the same person from time to time. Short-term goals have much less stability and need more immediate satisfactions.

Possibly an example will illustrate the point of view. A person has a long-term goal to acquire money. Short-term goals of money are then meaningful. Characteristic of such a person is saving and not spending. Another individual has as his long-term goal relaxation and recreation as offered by boating, golfing, country-club life, and cruises. The short-term goal of money is effective only as a means of having enough to take the cruise, and the opportunity to make money at the time the vacation is desired may be rejected.

On a somewhat different economic level, one man may want to work and save, but another may only want to just meet expenses. Offering him more money for working overtime may be meaningless to him. The girl who works in a factory and is looking forward to getting married may be temporarily moved to produce more units but will definitely prefer to stay out late on a date and not go to work the next day if she feels that the date is fun and may lead into marriage, and that she is not in danger of losing her job or can get another one if she does. Endless examples can be offered. The important point is that meaningful research is needed. To date, we have concerned ourselves more with ideal planning so that we can isolate variables; in so doing, we have lost track of the complexities and realities of motivation and work. The next step is good experimentation conforming to reality rather than the laboratory.

Motives and incentives when understood in an individual, in his group, and in the reality of the work situation can lead to describing behavior and predicting the success of short- and long-term goals. When management clearly states its goals, deals openly and honestly with its employees, and tries to ascertain their goals, then employees and employers can work together. Each will give a little, but in return each will be likely to gain more.

## Summary

This chapter may be somewhat disappointing to those who believe that the psychologist should know all about motivation and hence should be able to explain motives and predict behavior. In many respects, one of the great differences between the psychologist and the layman is that the psychologist is much more reluctant to make predictions about behavior.

Motivation is usually a complex process. An individual's drives are determined in part by certain physiological imbalances within him, in part by his previous experiences, and in part by the interaction of these two. Industry has tended to oversimplify the worker's motives by attaching too much importance to financial incentives. Many systems of incentive wage payments have been proposed. They overlap in many ways, and all of them are faulty because they exclude the many other motives that operate in man while he is at work, and they refuse to recognize that incentive systems themselves tend to cause fear of rate cutting or dismissal in his mind. The same starting wage reflects different attitudes in relation to the previous salary. This indicates that wages and their meaning are relative rather than absolute.

A study that attempted to discover the relative value of five common incentives on a job found differences based on sex, age, and marital status, but never found that salary was the most important of the incentives. Other studies find, similarly, that salary is never regarded by employees as the most important factor on a job.

Recent research indicates the value of coöperative incentives. The common goal of a united group can be a more powerful incentive than that of a number of people competing with one another for individual goals which, in the final analysis, they believe to be of little worth. People work because of pride in successful accomplishment, mastery of the job, and other equally potent social pressures. In many instances work is not as dissimilar to play as is ordinarily presumed. Of value in understanding motives as they operate on the job are biographical sketches and case histories, for they make possible a keener insight into the motives at work in people in industry. Such studies are more valuable than the assumptions of the industrial engineer or "expert" who believes that people work only for money.

Possibly the best means of understanding worker motivation is to consider the social meaning of work. In this respect, short-term goals and long-term goals of employees and employers may affect production variously. Accordingly, giving attention to the manner in which incentives are perceived is preferable to assuming that an incentive means the same thing to all.

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CHAPTER 4

# Measuring Attitudes

ALL people have attitudes which result in tendencies to respond positively or negatively to another person, a group of people, an object, a situation involving objects and people, or an idea. Very often the possession of an attitude predisposes the individual to react in a specified direction. This being so, a knowledge of the attitude allows for the prediction of behavior.

An attitude is acquired or learned by the individual, and at times the learning process is so subtle that he may not even recognize the attitude he possesses or truly understand how it was acquired. Attitudes may be rational or irrational, and the possession of intelligence is by itself no guarantee of a larger number of rational attitudes. The individual who has a certain attitude often has to rationalize or self-justify his reasons for it by drawing upon only the illustrations that back it up.

The acquired determining tendency in one's thinking or behavior may be the result of fact or opinion, but for the person who holds the particular attitude this has no real importance. An observer will find that he whose attitude is based on opinion may be more intense about it than one whose attitude formation is based on facts.

In the Hawthorne Studies we saw that the attitudes of employees were significant in determining production, which is usually management's yardstick of efficiency. A more favorable general attitude was apparently the biggest factor in increasing production in the Relay Assembly Test Room. An attitude or belief that increased production would result in decreased rates was the factor that restricted production in the Bank Wiring Observation Room, in spite of a financial incentive plan whose purpose was to increase it. In other words, attitudes may affect production upward or downward or hold it constant. In fact, the attitude toward an incentive may make it workable or not when the yardstick is production.

One of the most fruitful pursuits for the industrial psychologist is to study the attitudes of employees and employers. Although some work has been done in this field, most of it has been aimed at gaining knowledge of employee attitudes. This is understandable, since these studies are usually paid for by employers who are motivated by a desire either to promote efficiency or to iron out some of their difficulties with employees.

Employers, of course, have attitudes on as many things as employees, and the two are usually somewhat different. Employers' attitudes may lead to incorrect assumptions about employees or, sometimes, to employee behavior that is the antithesis of that which was assumed or predicted. Of course, the same is true of employees. There is a need to study employer as well as employee attitudes in order to get more complete insight into the problem of employer-employee relations.

In studying the attitudes of employers and employees, one must not assume the absence of predetermining factors prior to the job situation or, for that matter, prior to the work history. Such assumptions are fallacious and are likely to lead to sterile results. That a person is likely to be a "little Liberal" or a "little Conservative" before his first job has been determined by the many interacting influences of school, church, home, community, etc. People are likely to favor or reject things in accordance with their background—or, sometimes, in spite of it. Thus, facts are too often interpreted in the light of one's predetermined attitude toward the other fellow's behavior. An employer may believe that his employees are interested only in salary and that they are not concerned with his problems. To prove this, he cites "facts" such as "soldiering," restricting production, willingness to break rules, etc. An employee may believe his employer is interested only in profits and that he treats him with less consideration than he does his machines. He, too, cites "facts" to prove this —low salary, deductions for minor infractions of rules, poor working conditions, and lack of interest in his problem of making a living. Not only is this a situation in which present and immediately past conditions contribute to the respective beliefs, but it is likely to be one that draws upon much of the past life of the individual, especially the part of it that is colored by emotion. The employer with an unfavorable attitude toward his employees is no more likely really to understand them than an employee with an unfavorable attitude toward employers is likely to really understand his own employer. Poor employer-employee relations and industrial warfare are the inevitable impasse. A better mutual under-

standing of attitudes will not remove emotion from the situation, because attitudes are of the very essence of emotions; but it will enable one to predict behavior with more accuracy and possibly to avoid conflict by bringing about changes in attitudes along fruitful lines.

Two additional characteristics of attitudes should be mentioned before we go into the subject of their measurement. The first is that attitudes are not necessarily a result of intelligence or comprehension. They are part of our hedonistic life. Beginning with simple sensory feeling of pleasantness and unpleasantness we develop likes and dislikes. We further develop emotions, moods, and sentiments. When an individual has an attitude toward a person, subject, or thing, some aspect and degree of feeling accompanies it. It may be a like or dislike, a mood, a sentiment, or even an emotion or passion. A favorable attitude toward a work place means that it is generally a pleasant office or factory and that we like to work there. We might prefer not to accept another job because we are sentimental about the place. We then find ourselves in a favorable mood and at times exhibit various emotional forms of behavior on or about the job.

An unfavorable attitude has similar hedonistic aspects, except that they are unpleasant. We dislike the setup. We are generally unhappy and in a depressed mood, hate our colleagues and bosses, and fly into a rage upon the slightest provocation.

While it is rare that attitudes change overnight, it is nevertheless true that they do change. This is their second characteristic. The fact that attitudes are susceptible to change makes their measurement more practical. To measure attitudes with scientific accuracy is one thing. To understand the formation of attitudes and to attempt to change the factors contributing to it is another. Although ordinarily this lies within the province of social psychology, all too often in the past the social psychologist has avoided the problems in his field that confront industry. It is also true that the industrial psychologist has often overlooked the methods and techniques employed by the social psychologist. Actually there is much overlapping of subject matter in these two fields, and work directed to the free exchange of knowledge and efforts between these two groups of psychologists, even to the point of ultimate integration, would be of great value.

If the industrial psychologist understands the complexities of attitude formation and the mutability of attitudes, he can do a better job in measuring industrial attitudes. Industrial psychology can make use of the techniques that have been developed by psychologists and modify them

for the specific purpose at hand. As more work is done in the field, new and better methods will become available.

Attitude measurement is a most useful device in the hands of industrial psychologists. Specific information about job satisfaction and industrial morale can be obtained. The effects of changes in working conditions and environment, incentives, training programs, and many other factors can be measured in more ways than through production records. If the attitudes of employees are known both before and after a change is made, its ultimate success can be predicted more accurately. For example, an employer inaugurates a change—a bonus, a new work bench, or whatever—because he believes his employees will like it. Afterwards he finds that conditions are worse instead of better and accordingly concludes that his employees are ungrateful. This conclusion may be wrong. If he had known their attitudes in the first place, instead of that particular change he might have made one that would have improved their attitudes, with resulting benefits to him and his staff.

When management wants to discover the sources of dissatisfaction and correct them, attitude surveys are justified. Surveys alone practically never increase production.

## Methods of Measuring Attitudes

Six methods of measuring attitudes, each with its advantages and disadvantages, will be described and illustrated. Which one should be used will often depend on the person or group upon whom the decision rests. Attitude measurement can be used by an individual employer, a trade association, a union, or an informal employee group. A satisfied staff, a strike call, an expansion of the group, or a series of changes in the plant may result from the facts uncovered. The methods to be described are: (1) impressionistic, (2) guided interview, (3) unguided interview, (4) questionnaire, (5) attitude scale, and (6) indirect.

### IMPRESSIONISTIC METHOD

The impressionistic method is nonstatistical, in that it does not lead to quantitative knowledge. It is based upon the observation of behavior and attitudes. From the point of view of science, it is the least desirable of the six; and yet because it is a method whereby attitude measures attitude, it is the most widely used. The industrial psychologist can only condone it. It is excusable when regarded as a preliminary to the others or when a very rapid spot survey must be made. The validity of the impressionistic

method varies from very low to rather good, depending to a large extent upon the training of the observer—whether he can remain neutral in the situation he observes, whether his background and identifications preclude the possibility of correct conclusions, and whether the results are forced in a certain direction. Since it is hard to tell who is a saint or a sinner either before or after the report is made, this method has its danger points and must be taken with at least a few grains of salt.

It must be recognized that the very source of data can be highly subjective. The reporter's biases, point of view, and previous attitudes toward similar experiences can determine what is perceived. Further, one's acceptance or rejection of the person reporting the impression often determines whether the impression is regarded as fact or fiction.

Industrial towns, factory sites, work conditions, and employee morale are often measured by the impressionistic method.

An illustration—and one intended to bring out its chief characteristic, impressions—is included. It concerns the author's impressions of Hershey, Pennsylvania, the seat of the Hershey Chocolate Corporation. The author claims the report is factual; some readers may claim that it is fiction.

Numerous visits there have led the author to conclude that this is the garden spot of America, at least as far as industrial towns are concerned. It seems to him that the employees are given much more than merely a chance to work for a living, to earn money. This small town contains more opportunity to live and enjoy oneself than does any other town of comparable—and, in many cases, much greater—size. For example, there is a community building that houses the community theater, a little theater, a junior college, a hospital, a gymnasium, a swimming pool, bowling alleys, game rooms, a social room, library, dining room, cafeteria, club rooms, and dormitories. Elsewhere in the town there is a park ballroom, an amusement park for picnicking and riding, trout pools, a zoölogical garden, a rose garden, playhouses and playgrounds for children, a sports arena, an outdoor stadium, and a department store. The school system is understood to be the largest consolidated system in the country, and includes grades, junior high, and senior high—with its academic, commercial, and vocational divisions—an industrial school, and a junior college. There are no tuition fees for any of this schooling. A side light on the school system is the program whereby 1000 orphan boys are housed on nearby farms and taught trades as well as given an education. At age 18 they receive a year's supply of clothing and $100 in addition to

what they may have saved from their weekly allowance. There is a palatial hotel on the hilltop and an inn, which, although much less pretentious, is clean and well kept. Guests receive miniature Hershey bars. Everything in the town, from the factory to the office building and the homes, is spotless. The people look happy and well fed, and the homes are in good repair. The streets are named after the various items used in the cholocate bars; the only thing that is not named Hershey is the post office.

To compare this with some of the mining towns in the same state is like getting a glimpse of Paradise and its opposite. This impression of Hershey, its factory, and its workers is extremely favorable. However, it is only fair to say that many people, professional psychologists included, who have had the same opportunities to observe the town do not agree with this view. To them the entire setup indicates an excessive paternalism, and they feel that the employees have been lulled into a false security and have consequently lost their zeal, ambition, and drive.

The reader may wonder about the possibility of industrial warfare in such a company. The fact is that in 1937 Hershey was the scene of bloodshed. Reference to newspaper files reveals that on March 18, 1937, Hershey signed an agreement with the United Chocolate Workers of America (CIO) recognizing the union as the collective bargaining agent for its members. On April 2, 1937, about 500 Hershey workers went on a sit-down strike; they occupied the main plant and forced a complete shutdown of the company. On April 8, 1937, the front-page headlines read: "Farmers oust 500 sit-down strikers in battle at Hershey Plant. Many injured. M. S. Hershey in tears." Finally, on April 24, 1937, an NLRB election was held, with 1542 voting for no union and 781 for the United Chocolate Workers.

Depending upon preconceived attitudes, many different conclusions can be drawn from this series of episodes. One might be that it pays to treat employees fairly; another might be that it doesn't. Since the author holds no brief for either generalization—because neither is warranted—it is not necessary to draw any conclusion except to observe that the impressionistic method needs bolstering. More rigid and exacting techniques for measuring attitudes are necessary, and the remaining five supply them. The first two are specific types of interviewing used in the measurement of attitudes. They differ in organization and in the type of question asked.

#### GUIDED INTERVIEW

The guided interview is a purposeful conversation in which the interviewer tries to obtain honest and complete answers to a set number of questions. Like all interviews, it has the advantage of face-to-face contact. The interviewer must abide by certain rules. He must limit his talking to the minimum; asking questions and saying a few words here and there to impress the interviewee with the importance of what he is saying is enough. The interviewer should never argue or give advice; he should have skill in refraining from both of these. He should refrain from expressing his private convictions. He must be sympathetic and encouraging but make no suggestions.

The interviewer must try to have all his questions answered and he must ask all his subjects the same questions in the same way. The questions must be fair, they must be capable of an answer, and they should not be leading. They must not be embarrassing. A fair and complete record of the interview should be kept. Usually the best time to make this record is immediately after the interview, from sparse notes taken during it. This type of interview is used most frequently in industry when considering an applicant for a job. The employer or his representative may use it in handling group complaints of workers. It has not been used very often in determining employee attitudes.

The reader must be cautioned about interviewing. It is difficult, much more difficult than one suspects. The pitfalls are many. In the hands of the inexperienced, the interview is likely to turn into a pep talk, a biased series of questions, or an argument.

The guided interview is a relatively expensive method of determining employee attitudes. Unless an experienced person conducts it, the results are likely to be as inaccurate as those obtained with the impressionistic method. To do a survey of 100 employees usually requires from 100 to 200 hours. This time includes planning, preparation, interviews, analysis of data, and the writing of the report. While it is not necessary to argue how much the services of an industrial psychologist are worth, the prevailing scale paid to consultants varies between $50 and $100 a day, which makes the total cost likely to run between $1000 and $2000. This frightens a great many employers and encourages them to use the impressionistic method.

The guided interview is valuable in so far as it yields information on the specific frustrations of employees. It shows what has gone wrong

with the beautiful blueprint of organization and communication. It has many other advantages, as the Hawthorne Studies have indicated.

A study by Stagner, Rich, and Britten (*18*) illustrates a guided interview with the "closed" type of answer. In such an interview, the respondent is asked a series of specific questions and is expected to answer with one of a number of answers that are provided. In its most simple form the "closed" type of answer is either "yes" or "no." A group of 159 machine tool workers were interviewed in their homes. Thirty-four brief questions were read to them and the answers were recorded on a five-point scale from emphatic "yes" to emphatic "no." Each interview was short, lasting only about eight minutes. A numerical scoring system was used on which a number between 1 and 5 was assigned each answer. Since 19 questions, according to the authors, were related to job satisfaction, it was possible to get a total score for this attitude. Perfect satisfaction would yield a score of 19 and complete dissatisfaction a score of 95. In this study the range was from 27 to 67, with an average of 43.5, indicating that the average worker in this group was "satisfied" (neutrality would be 57).

Extremely satisfied and extremely dissatisfied workers were then selected on the basis of their scores in an effort to determine the questions that most clearly differentiated these two groups. Some of the questions used in the interview are reported in Table 4.1, together with the percentage of satisfied workers and the critical ratios (reliability of the difference between the satisfied and the dissatisfied groups defined in a study; a CR of 3 or more indicates a statistically significant difference). The main object in presenting this table is to illustrate the type of question asked in a guided interview on job satisfaction. The results are to be considered of secondary importance. (The questions are arranged by their critical-ratio value and not in the order asked.)

The table shows that although a small proportion of the workers were satisfied with their pay this question nevertheless differentiated to the greatest extent the satisfied workers from the dissatisfied ones. Each question in Table 4.1 can be examined in terms of the way the entire population would probably answer, and thus a list of satisfactions and dissatisfactions can be constructed. It can also be analyzed in terms of the way dissatisfied workers differ from satisfied workers. For example, "pay," "liking the kind of work," and "relation of enjoyment of work and spare-time activity" successfully differentiate the two groups. However, "friendly with the men," "boss interferes," and "bosses' orders disagree"

Table 4.1. Factors Influencing Job Satisfaction of Machine Tool Workers
(Ranked in order of importance to them)
$N = 159$

| Question | Percentage Satisfied | | Critical Ratio Between Extremely Satisfied and Extremely Dissatisfied Groups |
|---|---|---|---|
| | Interviewer A | Interviewer B | |
| 1. Do you feel the factory could afford to pay more? | 10 | 15 | 6.92 |
| 2. Do you like the kind of work you do on your job? | 87 | 80 | 5.86 |
| 3. Do you get as much enjoyment from your work as from your spare time? | 48 | 55 | 5.77 |
| 4. Are you told when you are doing a good job? | 40 | 52 | 4.47 |
| 5. Do you feel allowed to offer suggestions as to methods of improvement? | 74 | 80 | 3.83 |
| 6. Do you believe that the bosses and supervisors are always fair to you? | 91 | 92 | 3.76 |
| 7. Do you think you could do better if given a chance at another job? | 44 | 45 | 3.48 |
| 8. When you make a mistake in your work, do you always get a square deal from those deciding the case? | 97 | 83 | 3.48 |
| 9. Do you feel that your present hours are too long? | 67 | 54 | 3.30 |
| 10. Do you feel sure of your job as long as you do good work? | 90 | 87 | 3.13 |
| 11. Do you feel your pay is fair as compared with equally important jobs in the factory? | 75 | 80 | 2.96 |
| 12. How do you like your foreman? | 92 | 85 | 2.95 |
| 13. Would you rather be sure of steady work at your present job than have the responsibility of being a boss? | 60 | 63 | 2.28 |
| 14. Should the mill where you work be fixed up in light, heat, ventilation, etc.? | 79 | 67 | 2.22 |
| 15. Do you think it makes a difference to the company that you're on the job? | 52 | 56 | 1.99 |
| 16. Do you think the management should tell the men more about when the mill is going to close, reopen, or when new orders are coming through? | 51 | 66 | 1.50 |

Table 4.1 (*Continued*)

| Question | Percentage Satisfied Interviewer A | Percentage Satisfied Interviewer B | Critical Ratio Between Extremely Satisfied and Extremely Dissatisfied Groups |
|---|---|---|---|
| 17. Do you feel free to carry your troubles about your work to your boss? | 91 | 90 | 1.33 |
| 18. Do you feel that orders from your bosses many times disagree with one another? | 44 | 57 | 0.76 |
| 19. Does the boss interfere too much in your work? | 94 | 91 | 0.59 |
| 20. Are you friendly with the men who work alongside of you? | 96 | 98 | 0.57 |

are items that do not distinguish the two groups successfully.

Another example of the guided interview technique is the work of Kornhauser (*12*). While he was broadly concerned with the attitudes of Detroit people toward Detroit, at least two points in the study have particular reference here. Three hundred and twenty-four employed people rated their job satisfaction in the following categories:

| | Percent of Satisfaction |
|---|---|
| Very satisfied | 62% |
| Fairly satisfied | 35% |
| Rather dissatisfied | 2% |
| Very dissatisfied | 1% |

In response to the query "What do you like about your job? What don't you like about it?" the principal likes and dislikes mentioned are listed in Table 4.2.

A quotation from one of the paragraphs of the study is most interesting in view of its implications:

Not less interesting is a related discovery. Whereas 68 per cent of skilled and 51 per cent of non-skilled factory workers mention "inherent interest, nature of work" and the like as reasons for liking their jobs, only 38% of skilled and 27 per cent of non-skilled workers outside of factories cite smiliar reasons. This tends to refute the notion that auto-plant jobs are especially robot-like, deadly or devoid of interest. At the same time, however, it is to be noted that factory workers speak much less than non-factory workers of freedom, personal respon-

Table 4.2. Principal Likes and Dislikes on the Job (12)

| | | Percent of 324 Employed People[a] |
|---|---|---|
| Things liked about job | Kind of work done; nature of job | 48 |
| | People I work with | 32 |
| | Pay | 23 |
| | Freedom; personal responsibility | 16 |
| | Work environment; working conditions | 14 |
| | The company; the bosses; people I work for | 13 |
| | Hours | 7 |
| | Chance for advancement | 5 |
| | | **Percent of 324 Employed People** |
| Things disliked about job | Kind of work done; nature of job | 13 |
| | Work environment; working conditions | 13 |
| | Hours | 8 |
| | Pay | 7 |
| | People I work with | 6 |
| | Irregular; not a steady job | 3 |
| | The company; bosses; people I work for | 2 |
| | No chance for advancement | 2 |

[a] Many persons mentioned two things they liked, which explains why the percentages total more than 100 percent.

sibility and opportunities for advancement as sources of job satisfaction. Among all the occupational groups, moreover, there are remarkably few references to chances for advancement.

Heron, working in this area, has proposed a fifteen-item job satisfaction inventory (9). The nature of the questions allows them to lend themselves readily to either a multiple-choice type of response on a five-point scale or a considerable degree of verbalism. By way of illustration his inventory is presented. It is a good model.

HERON'S JOB SATISFACTION INVENTORY (9)

1. How do you feel you have *got on* since first coming here?
2. As a *place to work,* how does transport compare with other places in this area (or where you lived before)?
3. How much does your job give you a chance to *do the things you are best at?*
4. How fresh do you *usually* feel at the end of the day?
5. Not counting all the other things that make your job good or bad, how do you like the *kind of work* that you do?
6. How do *your mates* think this job compares with most other jobs?

7. How convenient are the *hours* on this job?
8. How do you find the transport department as an *employer?*
9. How well do your average earnings supply a *decent standard of living?*
10. How *interesting* is this job?
11. What is your opinion about the *speed* at which a guard has to work during *peak hours?*
12. How well is the transport department *run?*
13. How do you *like* your job?
14. How do you feel about your *prospects of advancement* in the transport department?
15. How *satisfied* are you with your job?

#### UNGUIDED INTERVIEW (NONDIRECTIVE)

The third method of determining employee attitude is the unguided interview, or the non-directive interview. Although there are differences between the two, for purposes of industrial psychology they can be considered similar.

The unguided interview is characterized by the free nature of the discussion and by the fact that it is the person interviewed who really defines its limits. There are no specific questions that the interviewer must ask; his main concern is to probe and establish the emotional content of the interview. Carl Rogers is one of the leaders in promoting this type of interview as a form of psychotherapy; the reader will benefit greatly by reading his book *Counseling and Psychotherapy* (*16*).

The Hawthorne group has been responsible for many advances in the application of this technique to industry. One of their contributions is a series of rules of orientation and of conduct. The rules of orientation are as follows:

1. The interviewer should treat what is said in an interview as an item in a context.

1A. The interviewer should not pay exclusive attention to the manifest content of the conversation.

1B. The interviewer should not treat everything that is said as either fact or error.

1C. The interviewer should not treat everything that is said as being at the same psychological level.

2. The interviewer should listen not only to what a person wants to say but also for what he does not want to say or cannot say without help.

3. The interviewer should treat the mental contexts described in the preceding rule as indices and seek through them the personal reference that is being revealed.

4. The interviewer should keep the personal reference in its social context.

4A. The interviewer should remember that the interview is itself a social situation and that therefore the social relation existing between the interviewer and the interviewee is in part determining what is said.

4A1. The interviewer should see to it that the speaker's sentiments do not act on his own.

The rules of conduct are:

1. The interviewer should listen to the speaker in a patient and friendly, but intelligently critical manner.
2. The interviewer should not display any kind of authority.
3. The interviewer should not give advice or moral admonition.
4. The interviewer should not argue with the speaker.
5. The interviewer should talk or ask questions only under certain conditions:
   a. to help the person talk.
   b. to relieve any fears on the part of the speaker which may be affecting his relation to the interviewer.
   c. to praise the interviewee for reporting his thoughts and feelings accurately.
   d. to veer the discussion to some topic which has been omitted or neglected.
   e. to discuss implicit assumptions, if this is advisable.

These rules are not cited because they are either self-explanatory or above debate, but because they give an idea of the general conduct of the interview. Excerpts from two interviews show both the varied nature of the discussion and the underlying principles involved.

Employee. Things went along pretty well for a long time, although at times I was a little discouraged, as during the time I was laid off for three or four months there were quite a number of changes in supervisors; and when I came back to work in Department ——— I was very much surprised.

Interviewer. How's that?

Employee. It seems that it was my destiny to be working for a man who had been my supervisor three times before on outside jobs. We had always got along together then, but there seemed to be a certain coolness developed between us—why, I don't know—but I did my work and said nothing. His attitude toward me did not get any better and many a time I had reasonable cause for complaint, but I kept still.

Interviewer. Is that so?

Employee. Yes, he used some very abusive language at times. . . . Last year I was hit a terrible blow. My seventeen-year-old girl was taken away from me. She was sick not quite a week. She died of spinal meningitis.

Interviewer. That's too bad.

Employee. Yes, she was a dandy young lady. She would have graduated from high school this February.

My daughter's death caused my wife to have a general nervous breakdown

a week after my girl was buried. That meant I had to send her to the hospital right away. In the course of her treatment in the hospital, the doctors advised me that in addition to her nervous condition she was in a very delicate condition. I could hardly believe it, but later on I was convinced. Well, my wife was in the hospital for about nine weeks and then came home.

About seven and a half months after that I was the father of twins, a girl and a boy, and the birth of twins, along with my wife's nervous condition, left her in a very bad shape. She came home from the hospital three weeks after the twins were born. She was unable to walk; in fact, she was almost an invalid. A week or two later, while my other girl who is fifteen years old went to the store and there was nobody else around, my wife made an attempt to walk, and in doing so she was so weak that she fell and knocked one kneecap out of place and injured herself internally. I had to send her back to the hospital. She was there from three to five weeks, I think, and now she is practically an invalid.

I have been advised by the doctors that what she needs the most is rest and quiet, and I am saving every penny so that I may be able to send her to a sanitarium.

Mr. Interviewer, aren't you getting tired of listening to me?

Interviewer. No, indeed I am not. Go right ahead. I am very much interested.

Employee. Well, all the time that I was having this trouble my supervisor, a man whom I worked with twelve years, treated me like a dog.[1]

Excerpts from another interview are as follows:

Interviewer. You feel that there is a little politics played, is that it?

Employee. A little? Well, I think there is a great deal of it, if you are asking me. This friendship stuff, stepping out with the boss, goes a long way around here. A blind man could see that.

Interviewer. You feel that stepping out with the boss gives a person a drag?

Employee. A drag? Say, he is sitting on top of the world. It doesn't make any difference whether he knows anything or not. He is put on a job and is sure to remain there as long as his friend remains a department head. Usually the man has ample time to get experience and with the department head coaching him along, he has probably developed himself well enough so that by the time his friend is transferred he is rather familiar with the job.

Interviewer. You mentioned that you were a supervisor one time. What capacity were you in?

Employee. I was a section head in the X department at one time. I was later made a section head in charge of the Y department.

Interviewer. Were you given any reason why you were taken off this supervising work?

Employee. No, they never told me a thing. They took me off and made me

[1] Reprinted by permission of the publishers from F. J. Roethlisberger and William J. Dickson, *Management and the Worker—An Account of a Research Program Conducted by the Western Electric Company, Hawthorne Works, Chicago,* Cambridge, Mass., Harvard University Press, 1939.

like it. That's what makes me mad. They do these damn things and they never give a fellow any explanation. They put anything they feel like down on this personnel record, and it goes upstairs and the employee never knows what is on that record. I don't see how they can do that. If they put anything on record, I don't see why the employee is not allowed to see it. I think if they would show these things to the employees, an employee would have an opportunity of correcting these wrongs if he only knew what they were. When raise time comes along, you don't get a raise and they never give you any reason why. They just tell you that you are doing a good job, to keep it up, that they are very sorry but they didn't have enough to go around. Of course, that's very possible, that everybody can't get a raise every time, but I think they should arrange it so that certain ones would get a raise one time and the others another time. They also tell you that you are not under limit of the job, but they don't give you any more money. I can't figure that thing out.

If a fellow gets up around $50 a week, he is at a standstill. It's been two and a half years now since I have had an increase. I am working just as conscientiously as I ever did. I am always living in hope that the next time I'll get a raise. When a fellow is married and has a family, there are always certain places for your money every week.[2]

The greatest advantage of this type of interview is that when it is conducted correctly the interviewer is fairly sure of getting at what is on the worker's mind and thus is enabled to understand the attitudes of employees. Its disadvantages are that it is difficult to summarize and requires laborious study. It is also time-consuming and costly, and sometimes presents problems that most industrial concerns believe are out of their province.

#### QUESTIONNAIRE

The questionnaire lends itself to the mass-production techniques of determining employee attitudes. In some respects there is more similarity than difference between this method and the guided interview. For example, the study by Stagner, Rich, and Britten (*18*) might just as well have been a questionnaire study. The fact that eight minutes is reported as the length of the interviews means that they went at a very rapid pace. However, it may be that these authors preferred to question the workers in their homes because they felt they would get more honest answers. It is also possible that they wanted workers from various plants or were afraid they would not be given permission to conduct their survey at the

[2] *Ibid.*

plant. In any case, they could have distributed these questionnaires at one time if they could have got the subjects together. On the other hand, the interview usually affords an opportunity for the interviewer to observe the subject's feelings and manner of answering questions. Although these two methods overlap, the questionnaire is more economical because one person can administer it to a large group at one time. This method also has the advantage of eliminating any effect the interviewer may have on the respondent and of not requiring as much experience or training on the part of the interviewer as the other methods do. It has the disadvantage of securing no more information than that provided by the answers to the specific questions and of lacking the spontaneity of the unguided interview.

The use of the questionnaire method in determining employee attitude is exemplified in Kolstad's study (*11*). Kolstad constructed a questionnaire designed to measure the attitudes of certain employees in a department store, toward specific items and the overall job morale. He defines morale by listing the following 10 attitudes or beliefs that were expressed by employees with high morale:

1. Feels very sure of holding his job as long as he does good work.
2. Has been made to feel in every way that he is really a part of the organization.
3. Feels that the management does a great deal more than could be expected to maintain good working relationships between him and the people with whom he works.
4. Feels that the management of this store is more interested in the welfare of the people in jobs such as his than are any of the other department stores in the city.
5. Has never been dissatisfied with his job or if he has, such dissatisfaction was hardly ever the store's fault.
6. Believes that this department store treats its employees better than any of the other department stores in the city.
7. Feels that the management is always fair with the employees in jobs such as his.
8. Feels that his immediate superiors are always fair in their treatment of him.
9. Can always find out whether his work is improving or not.
10. Knows of no other department store in the city in which he would rather work if he could get the same job at the same salary in one of them.

Ten multiple-choice questions were used to cover these topics. Each question had five answers, the subject checking only one. A representative question was:

How much does the management do to have good working relationships between you and the people with whom you work?

( ) as *little* as possible
( ) much *less* than one would expect
( ) about as much as one would expect
( ) a little *more* than one could expect
( ) a *great deal more* than one could expect

The questionnaire was scored, the possible scores ranging from +48 to −48. The specific items that were found to be most closely related to morale (as defined by Kolstad) were:

1. Promotion of best-qualified persons.
2. Help available to get results expected.
3. Encouragement to offer new ideas and suggestions.
4. Fair hearing—square deal for grievances.
5. Pay increase when deserved.
6. Invitation to offer suggestions when plans are being made.
7. Freedom to seek advice when problems arise.
8. Reasons given when changes are ordered in work.
9. Information about plans and results.
10. No contradictory or conflicting orders.

The findings of this study, shown in Table 4.3, are based upon 740 nonselling and 660 selling employees. The table is presented not in order to demonstrate the nature of morale but rather to illustrate how scoring a questionnaire leads to quantitative results. These data indicate that the morale of the employees who sell is higher than that of employees who

Table 4.3. Average Morale Score

| | Selling Employees | Nonselling Employees |
|---|---|---|
| All | 22.5 | 10.5 |
| Men | 19.6 | 11.5 |
| Women | 23.6 | 9.2 |
| Married men | 19.0 | 15.4 |
| Single men | 20.1 | 9.7 |
| Married women | 24.2 | 10.7 |
| Single women | 23.3 | 9.0 |
| Length of service: | | |
| Less than 1 year | 22.5 | 12.3 |
| 1–5 years | 20.5 | 6.6 |
| Over 5 years | 24.6 | 12.6 |

do not sell. Kolstad finds no significant statistical differences between the scores of men and women, married and single men, or married and single women. He does report statistically significant differences in the scores based on length of service. Thus the group employed one to five years had a lower morale than either the short-term employees or those employed for over five years.

Since the main point of this chapter is to explain the principles of measuring attitudes, a minor comment may be made about the table in the original article. It is incomplete. Kolstad goes to the trouble of reporting averages and standard deviations for twenty groups but does not indicate the number in the subgroups. He merely reports the total number of employees in the selling and nonselling groups. As a result, it is impossible to check the reliability of the differences reported or to compute others. To fail to indicate the number of persons in a group is a serious error in statistical technique.

Kolstad also reports on the items investigated. He queried the employees on 34 specific items related to store pride, relations with superiors, promotion, pay, and factors influencing employee results on the job. The four items that he found most closely related to morale among the selling employees were:

1. Promotion of best-qualified persons.
2. Encouragement to offer new ideas and suggestions.
3. Understanding of difficulties of job by superiors.
4. Help available to get results expected.

The four items for the nonselling employees were:

1. Help available to get results expected.
2. Encouragement to offer new ideas and suggestions.
3. Fair hearing—a square deal for grievances.
4. Promotion of best-qualified persons.

A novel questionnaire technique has been proposed by Kerr (*10*). This system not only guarantees anonymity but also makes it unnecessary to do any writing or marking on the responses. The "Tear Ballot for Industry" has eleven appropriate questions. Each question furnishes five answers and all the person does in responding is to tear the appropriate arrowhead at the end of the answer.

Weitz and Nuckols compared the direct and indirect question technique as used in a questionnaire (*24*). As an example of the indirect approach the following question was used: "Approximately what per cent of the

agents in your company think that: The training they received was good. 0%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100%." As an example of the direct approach the following question was used: "The training I received for my present job was ....... poor; ....... adequate; ....... excellent."

The authors found that the direct and indirect items correlated with each other. They found that both, to some extent, could predict the criterion which they used, i.e., survival or continued employment. They also found that the direct items, in general, did a slightly better job of predicting survival and so they see no advantage in using the indirect question.

The methodological controversy over the use of direct and indirect items as a system of gathering data will of course continue. Summarizing all of the literature in this connection would allow one to make the generalization that there are as many evidences in favor of one as there are in favor of the other. Apparently the bias of the researcher enters into the situation. For the time being, both can be used, provided the known advantages and disadvantages of each are considered.

### ATTITUDE SCALES

The fifth method of measuring employee attitudes is the attitude scale. Here a series of statements is made and the employee is asked to check the items he believes apply to the company. The scale differs from the questionnaire not only in that statements rather than questions are used but also in that numerical weights are assigned to each statement in accordance with a previously worked-out procedure.[3] The attitude of the employee can thus be expressed numerically. As in all attitude survey methods, the purpose of the survey must be explained to the employees and they must be assured that their reports will in no way endanger their jobs.

Uhrbrock (*22*) has developed a scale to measure the attitudes of employees. The items in it and the values assigned to each item are shown in Table 4.4.

On this scale, 3934 factory workers obtained an average score of 6.34. Ninety-six clerks averaged 6.84 and 400 foremen had an average score of 7.19. Care must be exercised in interpreting these results, lest one come to the conclusion that the attitude of the typical factory worker is exemplified by the statement "I think a man should go to the hospital for even a scratch, as it may stop blood poisoning." After all, this statement has a scale value of 6.3 and is closest to the average of 6.34. Such a conclusion

[3] See L. L. Thurstone and E. J. Chave (*21*).

Table 4.4. Statements Used in Uhrbrock's Scale for Measuring Attitude of Employees Toward Their Company

| Scale Value | Statement |
|---|---|
| 10.4 | I think this company treats its employees better than any other company does. |
| 9.5 | If I had to do it over again, I'd still work for this company. |
| 9.3 | They don't play favorites in this company. |
| 8.9 | A man can get ahead in this company if he tries. |
| 8.7 | I have as much confidence in the company physician as I do in my own doctor. |
| 8.5 | The company is sincere in wanting to know what its employees think about it. |
| 7.9 | A wage incentive plan offers a just reward for the faster worker. |
| 7.4 | On the whole, the company treats us about as well as we deserve. |
| 6.3 | I think a man should go to the hospital for even a scratch, as it may stop blood poisoning. |
| 5.4 | I believe accidents will happen, no matter what you do about them. |
| 5.1 | The workers put as much over on the company as the company puts over on them. |
| 4.4 | The company does too much welfare work. |
| 4.1 | Soldiering on the job is increasing. |
| 3.6 | I do not think applicants for employment are treated courteously. |
| 3.2 | I believe many good suggestions are killed by the bosses. |
| 2.9 | My boss gives all the breaks to his lodge and church friends. |
| 2.5 | I think the company goes outside to fill good jobs instead of promoting men who are here. |
| 2.1 | You've got to have "pull" with certain people around here to get ahead. |
| 1.5 | In the long run this company will "put it over" on you. |
| 1.0 | The pay in the company is terrible. |
| 0.8 | An honest man fails in this company. |

is of course foolish, because 6.34 is the average of the mathematical weights of all the statements checked by the employees.

In fact, Uhrbrock reports that statements expressing a favorable attitude toward the company were checked by more than twice as many workers as checked the unfavorable statements. In addition to finding that foremen had more favorable attitudes than factory workers, he found that this was true more of women than of men and that employees who had worked for the company more than six years were slightly more favorably inclined than those with a shorter period of service. It will be noted that Uhrbrock finds a difference in attitude between males and females, whereas Kolstad does not. This is due to different samples, different levels of employment, and other similar factors.

A more simplified scale system merely asks the respondent to check the degree of agreement or disagreement in connection with a statement. The following example illustrates this method. Richardson, Bellows, Henry and Company does a considerable amount of employee attitude meas-

urement for its clients (*19*). As an example for one such study 94 statements were prepared and based upon preliminary interviews with a sample of employees' discussions with management, and general considerations based upon experience. These statements were intended to cover 10 specific areas, as shown in the following list.

| Area | Statement |
|---|---|
| *The Company* | 1. Headquarters gives proper attention to divisional operations.<br>2. Management really adds equipment and facilities as needed. |
| *Working conditions* | 3. The times for starting and ending our workday are satisfactory.<br>4. Lunch facilities are adequate. |
| *Pay* | 5. The general plan for reviewing salaries and merit raises is good.<br>6. My job pays what it should, compared with similar jobs in other divisions of the company. |
| *Benefits* | 7. Hospital-medical-surgical insurance coverage is satisfactory.<br>8. I have as much information as I need about the pension plan. |
| *Future opportunities* | 9. If business goes well generally, I feel sure of holding my job.<br>10. There is adequate provision here for developing employees for future supervisory jobs. |
| *Personal satisfaction* | 11. I enjoy my work.<br>12. My job gives me a chance to do those things I can do best. |
| *Organizational efficiency* | 13. I always know who is in charge of my work.<br>14. Higher-ups pass the buck if I go to them, about decisions for problems. |
| *Supervisor* | 15. My supervisor lets me work things out in my own way.<br>16. My supervisor is well liked by the people who work for him. |
| *Teamwork* | 17. People get along well with each other in my section.<br>18. In my section, people do not try to get ahead at another's expense. |
| *Communications* | 19. I am kept informed on what goes on here.<br>20. Other sections regularly tell us what we need to know about their work. |

Employees responded by indicating: (a) definitely agree, (b) inclined to agree, (c) inclined to disagree, or (d) definitely disagree. All questionnaires were filled out and anonymity was guaranteed. The results are presented in Figure 4.1. They compare the respondents who respond favorably in each of four categories: supervisory, nonsupervisory, in the company, and in other companies.

A valuable reference for those interested in building attitude scales in this area is the work of Uhrbrock (23). He has gathered over 700 short descriptive statements culled from interviewers' records and these have resulted in a table of 184 rating scale statements scaled from low to high. This material can serve as a source to those who need to construct such scales.

#### INDIRECT METHOD

The sixth method of attitude measurement has been described as the indirect method (26). It is intended to provide a more free reign of expression. Its objective is to explore the "deeper levels rather than to deal only with the manifest verbal content." It deliberately attempts to conceal the intent of the measurement and allows the experimenter to observe and measure without producing an effect on the attitude itself. Varieties of techniques have been included within this category and some are word associations, sentence completions, or picture and story theme completion.

The Evans and Laseau research known as "My Job Contest" conducted at General Motors is an example of the indirect method of attitude measurement (5). On the surface, this was a letter-writing contest on the topic "My Job and Why I Like It." Five thousand prizes were awarded including such items as a Cadillac, other General Motors cars, and on down to rear-view mirrors. A tremendous amount of employee participation occurred—almost 50 percent of the 297,401 eligible employees entered. The letters varied in length from one hand-written sentence to twenty typewritten pages. About 700 letters were written in languages other than English.

Management recognized that this served a greater purpose than a letter-writing contest. It presented the opportunity to thematically analyze the relatively unstructured reflections of employees. It was, therefore, an indirect method to measure attitude. Analysis of the content in the letters resulted in the establishment of 58 themes and formed the basis for reporting to each division the findings about its employees' attitudes toward their job and related conditions. Although the analysis made use of rather
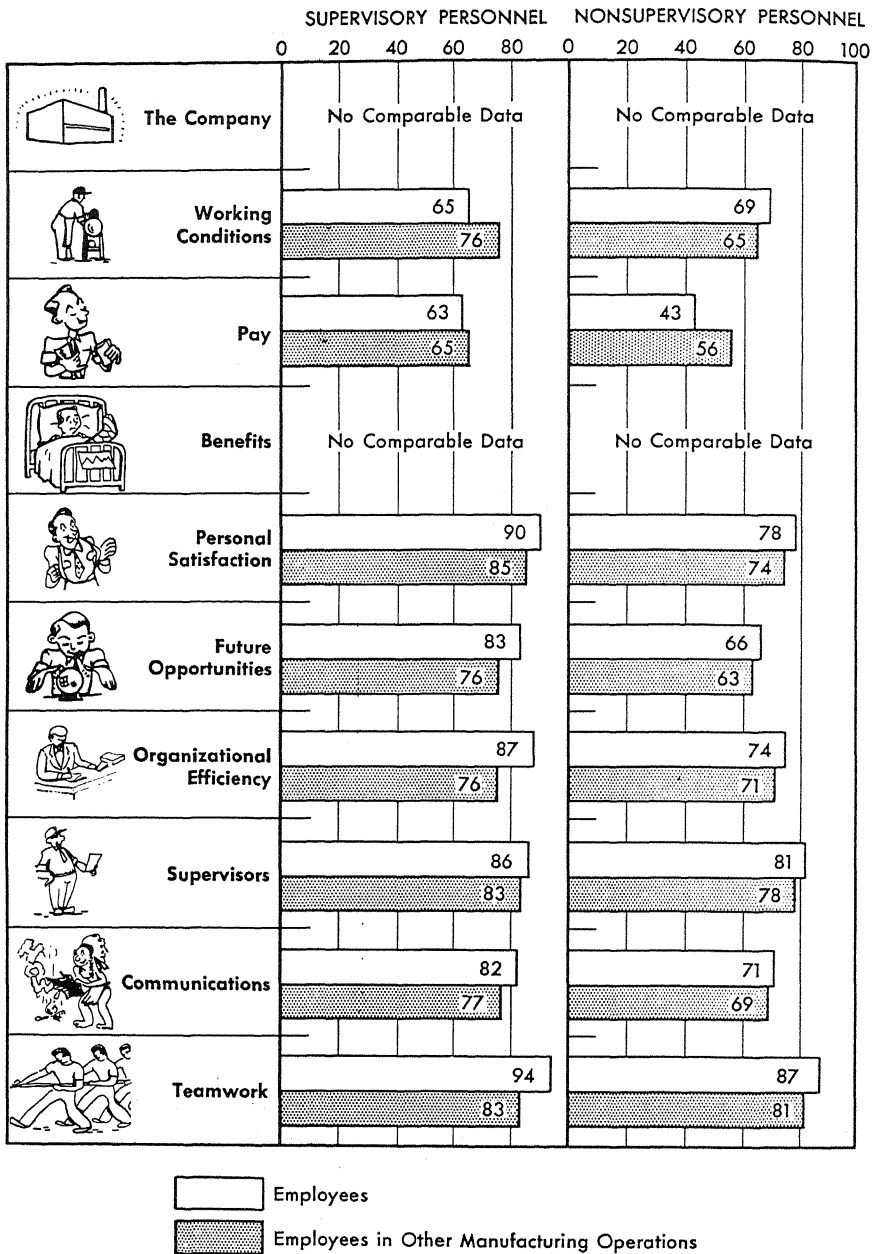
*Figure 4.1.* Comparison of Questionnaire Category Responses with Data from Other Surveys. (Courtesy of Richardson, Bellows, Henry & Co., Inc.)

exacting statistical techniques and recognized necessary procedural controls, it was communicated to management in an interesting and nontechnical manner. This is very important as a general principle. Too many industrial psychologists become so technical that they lose even their colleagues, let alone the management people who must understand and translate the findings into action.

### SIX BASIC GENERAL MOTORS PRINCIPLES

1. PUT THE RIGHT PEOPLE IN THE RIGHT PLACES

The careful selection and placement of employees to make sure that they are physically, mentally and temperamentally fitted to the jobs they are expected to do; to make sure that new employees can be reasonably expected to develop into desirable employees, and so that there will be a minimum number of square pegs in round holes.

RELATED MJC THEMES

1. Suitable placement
2. Attitude toward work
3. Kind of work
4. Comparison with other jobs
5. Associates

*Most Common Reasons for Above-Average Performance*

Divisions receiving above-average scores on the five themes applying to Principle #1 believe that three points account for their high standings:

1. Their employees have a good understanding of their jobs.
2. They use well-working systems for checking personnel records.
3. They train members of supervision in methods of effective placement.

*Most Common Reasons for Below-Average Performance*

1. Low skill jobs.
2. Limited available labor force.
3. Tendency to high turnover in new plants.

2. TRAIN EVERYONE FOR THE JOB TO BE DONE

The education and training of employees in the business, so that they will individually qualify for better jobs, so that their accomplishments will be limited only by their ambitions and abilities, and so that they will be able to do more efficiently the current work to which they are assigned.

RELATED MJC THEMES

1. Training, education, and experience

*Most Common Reasons for Above-Average Performance*

Almost without exception, those Divisions which ran up high scores placed major emphasis on the importance of training. In their reports they discussed

steps which they had taken and were continuing to take to make employees aware of their opportunities. Coöperative activities in connection with General Motors Institute and in-plant apprentice programs were carried out enthusiastically. Employees are kept informed on the progress of their programs.

*Most Common Reasons for Below-Average Performance*

1. Rapid expansion.
2. Frequent transfers due to changes in consumer demand.

3. MAKE THE ORGANIZATION A COÖRDINATED TEAM

The effective organization of the employees of the corporation into operating units; the cöordination and administration of these units, divisions, and departments so that there will be a minimum amount of friction and nonproductive or unnecessary work; the planning and organization of balanced facilities for the progressive manufacture of interchangeable parts; the proper control and direction of the whole enterprise without destroying the initiative of the individual employee.

RELATED MJC THEMES

1. Management
2. Supervision
3. Personnel policies
4. Personnel Department
5. Employee-employer relations
6. Teamwork—coöperation
7. Fair treatment
8. Nondiscrimination
9. Comparison with other companies

*Most Common Reasons for Above-Average Performance*

Among the Divisions scoring high on the items of Principle #3, emphasis on training foremen in human relations was apparent. Many told of their active interest in the subject, explaining that they took definite measures to make management well-known and well-accepted among the entire employee group. Divisions with many long-service employees pointed out that strong bonds existed between all levels because of management's faithful adherence to a promotion-from-within policy. They stressed the fact that they focused attention on the individual and publicized management's policy of fair and equitable treatment of all employees.

Some Divisions attributed their success as a management team to well-integrated training programs for developing executives. In such programs, all levels of management had opportunities to discuss current and long-range problems of business.

*Most Common Reasons for Below-Average Performance*

1. Newness of plant or Division.
2. Large number of employees.

4. SUPPLY THE RIGHT TOOLS AND THE RIGHT CONDITIONS
The quality of tools, the facilities, and the working conditions supplied for employees are highly important. The better the tools, facilities, and working conditions, the more that can be produced with the same human effort and the lower the cost of the products. When this results, higher wages can be paid and more good jobs can be provided. So General Motors wants the best tools and facilities we know how to create, and is prepared to spend millions of dollars currently and in the future to acquire them.

RELATED MJC THEMES

1. Safety
2. Tools, equipment, and methods
3. Modern plant or office
4. Air and temperature
5. Lighting
6. Cafeteria
7. Locker rooms
8. Washrooms
9. Cleanliness
10. Parking facilities
11. Plant location and transportation
12. Medical facilities
13. Hospitalization plan
14. Insurance plan
15. Working hours
16. Rest periods
17. Recreation
18. Parties and picnics
19. Open house celebrations
20. Information services

*Most Common Reasons for Above-Average Performance*

Responses from all the Divisions in the top flight of this category show that their managements make sincere and unflagging efforts to give extra attention to the task of providing satisfactory working conditions for their employees. Some Divisions ascribe their high ratings to the newness of their plants, or to recent remodeling and expansion. The older plants scoring well attribute their positions to their strict adherence to programs of alert maintenance of good facilities. The high scorers often administer their recreation programs through their employees, with active management support present, but unobtrusive. When considering the subject of facilities, they underscore "service to employees" as paramount.

*Most Common Reasons for Below-Average Performance*

1. Old plant and/or facilities.
2. Type of work.

5. GIVE SECURITY WITH OPPORTUNITY, INCENTIVE, RECOGNITION
There must be individual application to the job in hand. To develop the maximum personal application to his job and his interest in it, each employee must have sound incentives to work. Such incentives include fair compensation, recognition for results achieved, reasonable security, and, at the same time, opportunity and hope for advancement in the organization.

RELATED MJC THEMES

1. Security
2. Steady work
3. Savings plan
4. Pension plan
5. Pride in stability of company
6. Opportunity for advancement
7. Personal history
8. Success theme
9. Wages
10. Benefits from wages
11. Suggestion plan
12. Paid vacations
13. Paid holidays
14. Pride in years of service
15. Leaves of absence
16. Seniority

*Most Common Reasons for Above-Average Performance*

All those Divisions that attained high scores in the incentive category reported consistent efforts to acquaint employees with the economic security benefits attached to working for a Division of General Motors. Most of them carefully follow a promotion-from-within policy.

The older Divisions explained that they had many long-service employees who would naturally stress the stability of their jobs.

Diversified products or stable ones in steady demand were mentioned.

New and growing Divisions noted diversity of jobs and increased opportunities for advancement as reasons for their above-average scores.

*Most Common Reasons for Below-Average Performance*

1. Plant located in urban, highly competitive labor area.
2. Seasonal employment cycles determined by consumer demands.
3. Reduction to 40-hour work week schedules.
4. Nature of the work.

6. LOOK AHEAD, PLAN AHEAD . . . FOR MORE AND BETTER THINGS
Superior products to be produced and distributed. These products must be attractive and meet the demands of customers. This requires research and a policy of continuing product development and improvement.

RELATED MJC THEMES

1. Pride in product
2. Pride in company
3. Pride in building a good product
4. Pride in important job
5. Pride in community relations
6. Company and America
7. Free Enterprise

*Most Common Reasons for Above-Average Performance*

The Divisions that attained above-average ratings on MJC themes supporting Principle #6 appear to have high morale and laudable *esprit de corps* among their employees. They go in for comprehensive community and public relations programs and they keep their employees informed about the job that's being done. All of them have had the advantages of manu-

facturing exciting war products or enjoy a history of leadership in craftsmanship.

*Most Common Reasons for Below-Average Performance*

1. Product undramatic or incomplete.
2. Newness of Division.

The rank order of the mention of themes is presented in Table 4.5 for a particular division of General Motors and for all divisions. In many respects this can be called a list of what is on the worker's mind as reflected through the letters and in contributing to what he likes about the job.

Table 4.5. Rank Order of Themes (5)

| Theme Name | Division % Mention | All Divisions % Mention |
|---|---|---|
| Supervision | 1 | 1 |
| Associates | 2 | 2 |
| Wages | 3 | 3 |
| Work type | 4 | 4 |
| Pride in company | 5 | 5 |
| Management | 6 | 6 |
| Training, education, experience | 7 | 13 |
| Opportunity for advancement | 8 | 14 |
| Insurance | 9 | 7 |
| Security | 10 | 12 |
| Pride in product | 11 | 8 |
| Pride in stability of company | 12 | 10 |
| Benefits from wages | 13 | 9 |
| Teamwork | 14 | 16 |
| Pride in important job | 15 | 20 |
| Safety | 16 | 11 |
| Tools, methods, equipment | 17 | 17 |
| Steady work | 18 | 24 |
| Fair treatment | 19 | 22 |
| Paid vacation | 20 | 18 |
| Nondiscrimination | 21 | 23 |
| Recreation | 22 | 28 |
| Medical facilities | 23 | 15 |
| Cleanliness | 24 | 19 |
| Suggestion plan | 25 | 26 |
| Job description | 26 | 27 |
| Comparison—other companies | 27 | 32 |
| Hospitalization plan | 28 | 21 |
| Company and America | 29 | 33 |
| Working hours | 30 | 30 |
| Free enterprise | 31 | 31 |

Table 4.5 (*Continued*)

| Theme Name | Division % Mention | All Divisions % Mention |
|---|---|---|
| Savings plan | 32 | 29 |
| Comparison—other jobs | 33 | 41 |
| Personal history | 34 | 36 |
| Pride in years of service | 35 | 35 |
| Parties and picnics | 36 | 54 |
| Suitable placement | 37 | 42 |
| Air and temperature | 38 | 34 |
| Cafeteria | 39 | 25 |
| Employee relations | 40 | 43 |
| Personnel policies | 41 | 38 |
| Lighting | 42 | 37 |
| Pension plans | 43 | 51 |
| Modern plant | 44 | 46 |
| Plant location and transportation | 45 | 39 |
| Personnel Department | 46 | 44 |
| Washrooms | 47 | 40 |
| Information services | 48 | 50 |
| Success theme | 49 | 53 |
| Pride in community relations | 50 | 45 |
| Paid holidays | 51 | 49 |
| Parking facilities | 52 | 48 |
| Leaves of absence | 53 | 56 |
| Pride in building good product | 54 | 57 |
| Seniority | 55 | 52 |
| Locker rooms | 56 | 47 |
| Rest periods | 57 | 55 |
| Open house | 58 | 58 |

Friesen (7) has developed an incomplete sentence blank which is an attempt to standardize this technique of measuring employee attitudes. A rather novel approach has been suggested by Baumgarten (2). She has collected a large number of proverbs concerning human, labor, and social relations. The subjects select those proverbs which they believe to be correct and incorrect. While this technique theoretically could evidence one's attitude, for the time being it has to be regarded as interesting and speculative.

Another indirect attitude measurement technique is known as "error-choice" and was originally suggested by Hammond (8). It attempts to measure attitude by requiring the respondent to choose between two

alternative answers, each of which is wrong, controversial, or not known. The direction of the choice is believed to indicate the attitude. Weschler demonstrated the use of this technique by constructing a test to measure attitude toward labor-management relations. While twenty-four of the items were real, sixteen were of the error-choice type. An illustration of this type of question is: "At present, the following percentage of people in the United States are entirely dependent upon jobs and have very few savings: (a) about 55%; (b) about 85%." (Note—correct answer is 70%.) Since the correct answer is not stated the answer response reveals the attitudinal direction of the respondent.

Weschler has raised four interesting questions as a result of the indirect technique (25) which point up the problem as to whether this is trickery or scientific method: (1) Do I have the right to investigate other people's attitudes? (2) Do I have the right to "deceive" (author's quotes) people in order to get at their attitudes? (3) Do I have the right to report on new indirect attitude measuring devices at a time when these can be used by unscrupulous politicians, or other selfish interests? (4) What is my responsibility for seeing that the findings which I report are properly interpreted?

These are significant questions and must be answered. Admittedly, the answers reveal the author's attitude and without a survey. The answer is an unequivocal "yes" to question 1—I have the right to investigate attitudes. The answer is "yes" to question 2, except that in our opinion the indirect method is not deception. The false answers willingly given by the respondents when direct techniques are used are the deceptions. As for question 3, we will always have unscrupulous politicians and selfish interests, so why wait for Utopia in order to do worth-while research? In answer to question 4, we believe that our research responsibility is great, but in a free society and with a press interested in circulation one may expect others to misinterpret. This should not deter the scientist but rather should encourage him to communicate more directly with the public.

The indirect method of measuring attitude is the newest development, is the most subtle, and conceivably has dangerous implications in the hands of the unscrupulous. Nevertheless it is a technique and will be used. Little good can come from wishing that the H-bomb were not in existence. More good can come from knowing of its existence and trying to work within its framework of possible destruction. In a much smaller and possibly insignificant way let us not hide our heads in the sands with reference to this technique of attitude measurement.

### Attitude Surveys and Their Application

Too often an attitude survey performed in industry, by whatever method chosen, is regarded as an interesting piece of literature that some people in management ought to read the first chance they get. This is money down the drain. Attitude survey results must be put to use and necessary changes introduced.

Executives must be prepared to face the real possibility that the attitudes they believe employees have do not coincide with employee attitudes. They must recognize that this difference or the revelation of the unexpected is not a threat to personal integrity.
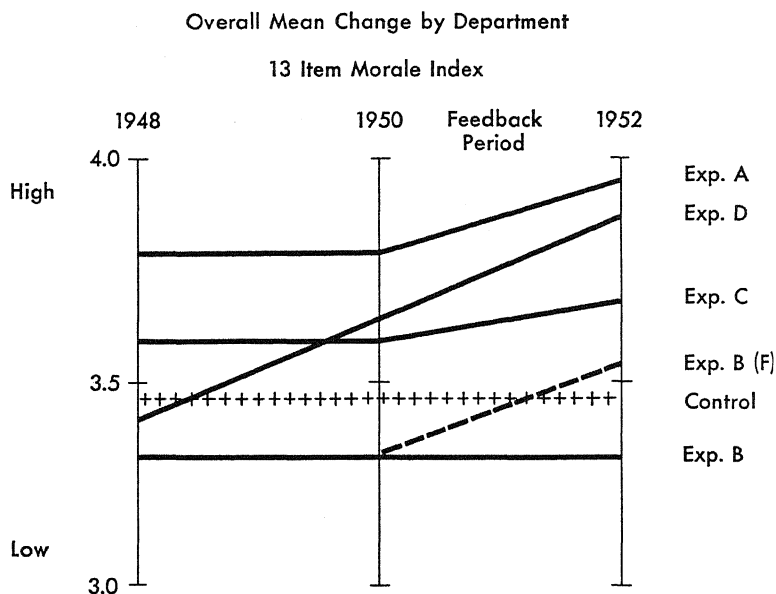
*Figure 4.2.* Survey Feedback Experiment. (From H. Baumgartel, "The Survey Feedback Experiment: A Study of a Program for the Use of Attitude Survey Data in a Large Organization," Survey Research Center, University of Michigan, 1953 [Summary of Technical Report].)

Bradshaw and Krugman (3) have proposed coupling attitude surveys with conferences. In one company they had a team of two members from each of six levels of management participate in a series of conferences. The conferences began prior to the interviews and continued for a discussion of the report findings. Within six months after the completion of the survey, action had been taken on the following projects:

1. A supervisory training program.
2. A revision of promotion policies.
3. A foreman selection program.
4. A reorganization of personnel and work procedures in a major department.
5. A revision of the suggestion system.
6. A program of providing employees with various types of factual information.

Baumgartel (*1*) reports an interesting experiment which clearly shows that a discussion of attituude survey results leads to substantial positive change. Figure 4.2 shows that the experimental groups with the feedback discussions had decidedly more favorable attitudes. The control group and the experimental group with no discussion remained the same.

### The Attitudes of Employees vs. the Attitudes of Employers

A report by S. J. Fosdick (*6*) indicates clearly that employers and employees have different ideas on the subject of morale. Table 4.6 shows the rank assigned to various factors in morale by these two groups.

Table 4.6. Rank Assigned to Factors in Morale

| Item | Employee Ranking | Employer Ranking |
|---|---|---|
| Credit for all work done | 1 | 7 |
| Interesting work | 2 | 3 |
| Fair pay | 3 | 1 |
| Understanding and appreciation | 4 | 5 |
| Counsel on personal problems | 5 | 8 |
| Promotion on merit | 6 | 4 |
| Good physical working conditions | 7 | 6 |
| Job security | 8 | 2 |

Inspection of this table shows that there is room for misunderstanding between the two groups. Thus employees rate "credit for all work done" and "counsel on personal problems" as more important than employers do, whereas the latter rate salary and security as the two most important items. It is also interesting to note that both groups rate good physical working conditions as relatively unimportant, and yet a great amount of money is spent on such things as air conditioning, light control, oil-absorbing floors, and music, and very little on attitude measurement. More will be said about this later; here it is necessary only to say that employers

continually underestimate the importance of attitudes on the assumption either that they know employee attitudes or that the attitudes of their employees are similar to their own.

Not many studies of employer attitudes have been made; work is necessary in this field. Even though the content of this chapter might seem to justify the title "Employee Attitudes," rather than the one used, the title was chosen in order to drive home the point that not only can attitudes be measured by the six methods described but these methods can be used to measure employer attitudes as well. The evidence indicates that both groups have attitudes toward each other that differ from their attitudes toward themselves. A clear exposition of this fact by a skillful technician would lead to greater mutual understanding. At the present time industry, as represented by employer and employee, lacks such insight.

One of the rare studies of executive attitudes is Cherington and Bergen's interesting report (*4*) of the attitudes of 51 senior executives in a large company. Prior to undertaking a study of the attitudes of its employees and supervisors, this company surveyed the attitudes of its 51 senior executives by means of a questionnaire. The questionnaire was "designed to bring out specific attitudes toward the various points of relationships between superiors and associates, the plan of organization and the effectiveness with which its various units had been co-ordinated, impartiality of executives, compensation, fairness in selecting junior executives for promotion, the effectiveness of executive training, union relations and the like." In addition, the questionnaire was designed to measure the general morale of this group and their "total" attitudes toward their work and the company. The item-checking method of filling out the questionnaire was used, and precautions were taken to insure anonymity.

The results show that the most unfavorable specific attitude held by this group concerned their compensation. Over 50 percent felt that the salaries for their positions were lower than those for other comparable positions in the company. Another source of dissatisfaction was the promotion procedure, as evidenced by the fact that less than one-third believed that the best man always received the promotion. These executives felt a strong need for a clear-cut organization plan and for more effective coördination of the various executives. Some respondents showed lack of any clear understanding of their own duties, responsibilities, and authority and those of their fellow executives. Only half of them believed that certain specialized departments—such as personnel, industrial engineering, and the laboratory—helped them in discharging their duties. Only half the

group felt that they were really part of the management of the company. The group expressed a desire for more intensive executive training and a need for information which they were not getting—on plans, the company's long-range programs, general business conditions, and development of labor relations in the company.

The executives ranked ten selected personnel practices in the following order of relative importance:

1. Fair pay.
2. Clean-cut definition of duties, responsibilities, and authority.
3. Promotion on merit.
4. Credit for work accomplished.
5. Job security.
6. Understanding leadership by superiors.
7. Adequate job instruction and related information.
8. Prompt and fair adjustment of grievances.
9. Fair layoff procedure.
10. Adequate retirement benefits.

Incidentally, the general morale of the group was good. A score of from 0 to 100 was possible. The average was 77, with a range of 55 to 97.

Two important points are revealed in this study. The first shows that there is room for misunderstanding because the employee's attitude and that of the employer differ. For example, an employee is not ordinarily inclined to think of senior executives as being concerned about equality of salary. The average employee believes an executives earns so much money that such problems cannot exist for him. How often does an employee think of a senior executive as feeling a strong need for clear-cut organization and for a definition of duties, responsibility, and authority? How many employees realize that a senior executive may not consider himself part of the management of the company? The second point shows that the employer's impression of the employee's attitude is not well grounded. This study indicates that the executive projects upon the employee his own evaluation of the importance of money. Fair pay ranks first in the list of personnel practices. Similarly in Fosdick's study, the employers rank fair pay first. Yet Fosdick's study and other studies of employee attitude show that employees do not rank this first. The attitude toward money will be considered more fully later. Here it is presented merely as food for thought.

## Summary

Six methods of measuring attitudes in industry have been described in this chapter: the impressionistic, guided interview, unguided interview, questionnaire, attitude scale, and indirect. In addition to discussing the advantages and disadvantages, an illustration of each method was presented.

The main concern of this chapter was with how attitudes can be measured in industry. The secondary concern was the fact that knowledge of employee and employer attitudes must be obtained if a greater insight and a better relationship between the two groups is to exist. Specific findings, although presented, were not considered very important. The specific factors that contribute to job satisfaction and industrial morale are discussed in the following chapters.

Whenever research on attitude measurement is performed it must be remembered that the researcher has the obligation to see that misinterpretation of results is avoided. Attitude surveys alone will accomplish little. Introducing the changes indicated and feedbacks to the interested parties can lead to positive results.

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CHAPTER 5

# Job Satisfaction

JOB satisfaction is the result of various attitudes possessed by an employee. In a narrow sense, these attitudes are related to the job and are concerned with such specific factors as wages, supervision, steadiness of employment, conditions of work, advancement opportunities, recognition of ability, fair evaluation of work, social relations on the job, prompt settlement of grievances, fair treatment by employer, and other similar items.

However, a more comprehensive approach requires that many additional factors be included before a complete understanding of job satisfaction can be obtained. Such factors as the employee's age, health, temperament, desires, and level of aspiration should be considered. Further, his family relationships, his social status, his recreational outlets, his activity in organizations—labor, political, or purely social—contribute ultimately to job satisfaction.

In short, job satisfaction is a general attitude which is the result of many specific attitudes in three areas, namely, specific job factors, individual characteristics, and group relationships outside the job.

## Confusion of Terminology

The methods employed in measuring attitudes were presented in the preceding chapter. We emphasized there that the studies reported illustrated the various methods and that the findings were of secondary importance. The main reason for this is the great confusion in the use of the term "job satisfaction" and in the factors that contribute to it. Reviewing the many studies in the area almost leads one to the conclusion that job satisfaction is anything that an author measures when he thinks that he is measuring "job satisfaction." Too few experimenters in this field have been concerned with either the reliability or the validity of their measures.

Some studies have dealt only with attitudes on some specific job factors

but have been called job satisfaction studies. Others have investigated other job factors and have also been called job satisfaction research. Still others have considered the individual factors and the job factors, and a few have attempted to measure parts of all three areas. It is no wonder that conflicting results are found in the literature on this subject. No one study is necessarily more in error than another, but most are incomplete. For example, an organization that has a good personnel program and offers steady work, good supervision, etc., may nevertheless find that a particular worker has little job satisfaction because of his capabilities in connection with his particular job, family problems, or unhappiness about his failure in union activities.

It is extremely difficult to rank the various factors involved in job satisfaction. They vary in importance not only from individual to individual but also in the same individual from time to time. For instance, an employee may be dissatisfied with his salary. When he gets a raise he may still be dissatisfied, but this time because he feels that the boss should have given it to him weeks ago.

One additional point must be made about the confusion among the terms "employee attitude," "job satisfaction," and "industrial morale." Although in many instances they are used interchangeably, they are not synonymous. An "attitude" is not "job satisfaction." However, it may contribute to job satisfaction since the latter is comprised of a number of attitudes. Similarly, job satisfaction is not the same as industrial morale, although it may contribute to morale. An illustration of the confusion in the use of these terms is afforded in an article by Dr. Arthur Kornhauser (*12*), a careful and brilliant scholar in the field of industrial psychology. In the Table of Contents of that issue of the *Journal of Consulting Psychology* this article is listed as "Psychological Studies of Employee Morale." However, the article itself bears the title "Psychological Studies of Employee Attitudes." In it the author makes cogent remarks concerning the errors and difficulties in the field, and yet he refers to job satisfaction and industrial morale as if they were identical and interchangeable concepts.

An attitude of an employee can be considered as a readiness to act in one way rather than another in connection with specific factors related to a job.

Job satisfaction is the result of various attitudes the employee holds toward his job, toward related factors, and toward life in general. Industrial morale is a by-product of a group and is generated by the group. It has four determinants: feeling of group solidarity; need for a goal; ob-

servable progress toward the goal; and individual participation in meaningful tasks necessary to achieving the goal. Industrial morale may be defined as the possession of a feeling, on the part of the employee, of being accepted by and belonging to a group of employees through adherance to common goals and confidence in the desirability of these goals.

Authors and experimenters have measured employees' reactions and have labeled them sometimes job satisfaction, sometimes morale, and at other times merely attitudes. There were similar practices years ago in the field of psychological testing. Thus an author of a test named it on the basis of what he believed it was measuring; "Technical Information" and "Teaching Aptitude" are examples. At the present time no one would dare propose a psychological test—and hope to keep his professional reputation—without establishing the validity of the test to prove that it measured what it was supposed to. In order that job satisfaction may be better understood, a clear-cut and decisive study of employees with high and low degrees of this is needed. Such a study might define the criteria as a combination of an employee's estimate of his own satisfaction, the boss's estimate of the employee's satisfaction, and other sources of information. These, in turn, could be compared with the various factors that contribute to job satisfaction. Only in this way can complete insight into it be achieved.

Why seek information about job satisfaction? For an industrial organization, the consequences are extremely important. By discovering attitudes on factors related to the job, a firm can correct certain bad situations and thereby improve the job satisfaction of its staff. From this point of view it would be justified in being concerned only with this area and neglecting the individual "ego" and its employees' adjustment to groups outside the plant. However, an industrial organization can benefit materially if it knows what individual attitudes contribute to job satisfaction. For one thing, applying this knowledge will result in better selection procedures. This is a broad implication as far as job satisfaction is concerned; and even though most industrial and business organizations feel that it is not their problem, it nevertheless exists. It is also directly related to vocational guidance, schools and colleges, public and private employment agencies, etc.; and society as a whole must face it realistically.

### Factors Measured in Job Satisfaction

Because of the ramifications of the problems connected with job satisfaction, surveys and studies have been carried out on a community-wide

Table 5.1. Responses on Hoppock's Questionnaire

1. Choose the ONE of the following statements which best tells how well you like your job. Please place a check mark in front of that statement:

| Response | Frequency | Percentage |
|---|---|---|
| I hate it | 5 | 2 |
| I dislike it | 6 | 2 |
| I don't like it | 34 | 11 |
| I am indifferent to it | 29 | 9 |
| I like it | 194 | 63 |
| I am enthusiastic about it | 27 | 9 |
| I love it | 14 | 5 |
| Total | 309 | 101 |

2. Check one of the following to show HOW MUCH OF THE TIME you feel satisfied with your job:

| Response | Frequency | Percentage |
|---|---|---|
| All of the time | 128 | 41 |
| Most of the time | 83 | 27 |
| A good deal of the time | 24 | 8 |
| About half of the time | 29 | 9 |
| Occasionally | 16 | 5 |
| Seldom | 14 | 5 |
| Never | 15 | 5 |
| Total | 309 | 100 |

3. Check the ONE of the following which best tells how you feel about changing your job:

| Response | Frequency | Percentage |
|---|---|---|
| I would quit this job at once if I could get anything else to do | 39 | 13 |
| I would take almost any other job in which I could earn as much as I am earning now | 13 | 4 |
| I would like to change both my job and my occupation | 20 | 7 |
| I would like to exchange my present job for another job in the same line of work | 12 | 4 |
| I am not eager to change my job, but I would do so if I could get a better job | 130 | 43 |
| I cannot think of any jobs for which I would exchange mine | 54 | 18 |
| I would not exchange my job for any other | 37 | 12 |
| Total | 305 | 101 |

Table 5.1 (*Continued*)

4. If you could have your choice of all the jobs in the world, which would you choose? (Check one):

| Response | Frequency | Percentage |
|---|---|---|
| Your present job | 145 | 48 |
| Another job in the same occupation | 48 | 16 |
| A job in another occupation | 107 | 36 |
| Total | 300 | 100 |

5. Check one of the following to show how you think you compare with other people:

| Response | Frequency | Percentage |
|---|---|---|
| No one likes his job better than I like mine | 59 | 19 |
| I like my job much better than most people like theirs | 50 | 16 |
| I like my job better than most people like theirs | 35 | 11 |
| I like my job about as well as most people like theirs | 114 | 37 |
| I dislike my job more than most people dislike theirs | 25 | 8 |
| I dislike my job much more than most people dislike theirs | 5 | 2 |
| No one dislikes his job more than I dislike mine | 18 | 6 |
| Total | 306 | 99 |

6. Which gives you more satisfaction? (Check one):

| Response | Frequency | Percentage |
|---|---|---|
| Your job | 200 | 66 |
| The things you do in your spare time | 102 | 34 |
| Total | 302 | 100 |

7. Have you ever thought seriously about changing your present job?

| Response | Frequency | Percentage |
|---|---|---|
| Yes | 122 | 39 |
| No | 159 | 51 |
| Omitted | 28 | 9 |
| Total | 309 | 99 |

Table 5.1 (*Continued*)

8. Have you ever declined an opportunity to change your present job?

| Response | Frequency | Percentage |
|---|---|---|
| Yes | 81 | 26 |
| No | 196 | 63 |
| Omitted | 32 | 10 |
| Total | 309 | 99 |

9. Are your feelings today a true sample of the way you usually feel about your job?

| Response | Frequency | Percentage |
|---|---|---|
| Yes | 267 | 86 |
| No | 19 | 6 |
| Omitted | 23 | 7 |
| Total | 309 | 99 |

basis, in specific professional or occupational groups and, of course, in specific industrial establishments.

One of the early community-wide surveys was conducted by Hoppock in the town of New Hope, Pennsylvania (*7*). Eighty-eight percent of the 351 employed adults answered the lengthy questionnaire. Table 5.1 presents the results.

These results indicate that 15 percent of the sample had negative attitudes or job dissatisfaction. This early finding is quite similar to the preponderance of evidence that has been reported since the days of 1933. Robinson and Hoppock have collated the data on 191 assorted studies reporting percentages of job dissatisfaction (*16*). The median figure is 18 percent dissatisfied.

These figures are quite different from the "common sense" view in which workers are considered as robots doomed to dissatisfaction in their work because of industrial mechanization and other self-attributed causes.

Hoppock asked 36 nationally prominent personnel officers to estimate percentages of workers who were dissatisfied. The answers ranged from zero to 80 percent, the average being 49 percent. As Hoppock points out, if numbers from 0 to 100 were put in a hat, the average of the numbers drawn would be 50. Hence it may well be that the 49 percent is as void of meaning as chance itself.

Kornhauser's study tends to refute the notion that auto-plant jobs are especially robot-like, deadly, or devoid of interest (*13*). He found that 51 percent of the nonskilled and 68 percent of the skilled factory workers mention "inherent interest, nature of work" and the like as reasons for lik-

ing their jobs. These percentages are higher than for nonfactory employees.

The view that is clearly taken is that the majority of the gainfully employed tend to have job satisfaction or are at least neutral. Only a small percentage have job dissatisfaction.

The Hoppock study results are presented along with others. The results are important but the reader should benefit by carefully examining the type of questions asked. Further application of developed methods can lead to further knowledge.

An index of job satisfaction was computed, the results being shown in Figure 5.1. A breakdown according to occupational classification indicates

| | 100-199 | 200-299 | 300-399 | 400-499 | 500-599 | 600-700 |
|---|---|---|---|---|---|---|
| Percentage of Cases | 6 | 6 | 10 | 12 | 40 | 26 |
| Number of Cases | 17 | 19 | 30 | 37 | 125 | 81 |
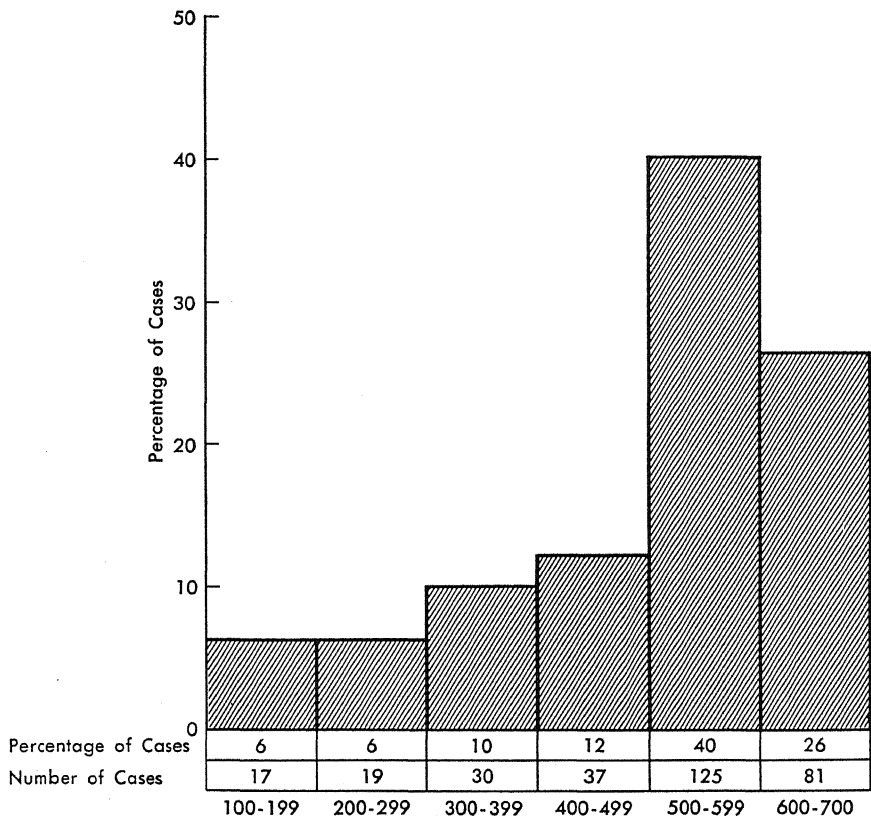
*Figure 5.1.* Distribution of Job Satisfaction Indexes, 309 Employed Adults. An index of 100 indicates extreme dissatisfaction; 700 indicates extreme satisfaction; 400 indicates indifference. (From Robert Hoppock, *Job Satisfaction,* New York, Harper & Brothers, 1935.)

that the average index is lowest for the unskilled category and highest for the professional category; this is shown in Table 5.2.

Table 5.2. Job Satisfaction Indexes of 5 Occupational Groups, New Hope, Pennsylvania, 1933

| Occupational Classification | Number of Cases | Range of Indexes | Mean Index |
|---|---|---|---|
| 1. Unskilled manual | 55 | 100–650 | 401 |
| 2. Semiskilled | 74 | 125–650 | 483 |
| 3. Skilled manual and white-collar | 84 | 125–675 | 510 |
| 4. Subprofessional, business, and minor supervisory | 32 | 250–700 | 548 |
| 5. Professional, managerial, and executive | 23 | 300–700 | 560 |

This survey indicated that there is considerably more job satisfaction than dissatisfaction when all the persons who are gainfully employed are included in the survey.

Hoppock also conducted a survey on people in one occupation, namely, teaching. Five hundred teachers from 51 urban and rural communities in the northeastern United States estimated their job satisfaction on four attitude scales. By combining these scales, a measure of job satisfaction was obtained. Of this group the 100 most and 100 least satisfied were asked about 200 questions. A comparison of their answers differentiated the satisfied from the dissatisfied teachers in the following areas:

1. The satisfied showed fewer indications of emotional maladjustment.
2. The satisfied were more religious.
3. The satisfied enjoyed better human relationships with superiors and associates.
4. The satisfied were teaching in cities of over 10,000 population.
5. The satisfied felt more successful.
6. Family influence and social status were more favorable among the satisfied.
7. The satisfied "selected" their vocations.
8. Monotony and fatigue were reported more frequently by the dissatisfied.
9. The satisfied were 7.5 years older.

One interesting finding is that the difference in average salaries between the two groups was not statistically significant.

One brief comment is necessary about this survey. No attempt was made to measure the proficiency of the teachers and therefore it is not known whether those who were dissatisfied were less "good" than the satisfied group. This survey also brings out the point that job satisfaction and vocational interest are not identical. For example, 84 percent of the dissatisfied teachers answered "yes" to the question "Is your work Interesting?"

In the epilogue to his study on job satisfaction, Hoppock proposes the following six major components of job satisfaction:

1. The way the individual reacts to unpleasant situations.
2. The facility with which he adjusts himself to other persons.
3. His relative status in the social and economic group with which he identifies himself.
4. The nature of the work in relation to the abilities, interests, and preparation of the worker.
5. Security.
6. Loyalty.

These six items are not of the minute and specific character measured in many studies on job satisfaction. Possibly that is what is wrong with these studies. Hoppock's approach is to be commended for this reason; he is aware of the real factors which contribute to job satisfaction and does not get lost in the petty details. Job satisfaction is an important generalized attitude in an individual, not a specific attitude about specific job factors. The idea that it is related to the individual's emotional adjustment suggests that those who are unstable emotionally may have considerably more difficulty adjusting themselves to a job, and may therefore be dissatisfied with it.

Anyone who has ever held a job knows that if he does not get along with his co-workers the job is unsatisfactory. The most rugged, aggressive, and independent individual will not be satisfied at work if he cannot get along with the working group. Furthermore, adjustment to people on the outside affects a person's adjustment to his job. A secretary who is not getting along with her boy friend or a husband who has had an argument with his wife is likely suddenly to find some dissatisfaction with the job which did not exist before; this usually disappears just as suddenly, after the "kiss-and-make-up" stage.

In our culture, as in many others, there is a strong desire to be approved and respected by others, especially one's friends. If an individual is to

have job satisfaction, he must feel that he is on a par with his friends. College graduates consciously or unconsciously sacrifice money when they enter the professional rather than the business field. They are reluctant to choose selling as an occupation because they feel they are "too good" for it. The fact that they eventually sell professional services does not bother

*Figure 5.2.* Don't Tell Me That Happened at Work! (Courtesy of Liberty Mutual Insurance Corp.)

them, whereas selling insurance or hats usually does. The factory worker whose friends also work in a factory can feel he is as good as they are; he will have greater job satisfaction than the factory worker whose friends are mainly office workers.

Job dissatisfaction may well be the result of a lack of vocational guidance. A person who is "too good" or "not good enough" for a job, in terms of his abilities and interests, is not likely to be satisfied with his job. See Figure 5.2. During the depression years college graduates were available

at a "dime a dozen." Department stores discovered this and proceeded to hire them at almost this rate. But they soon had to discontinue this policy, because the young men and women were "too good" for the job and left in droves, despite the fact that there were few positions open. People are not capable of working for any length of time at a job which they feel is below them. This is true also of people who do not possess the necessary abilities. A college professor who cannot keep up with his students is likely to be a "sad sack." He may come to the conclusion that his students ask questions only to prove how smart they are. Certain police departments face the peculiar problem of having officers who are less capable than the patrolmen. Friction results. The same thing applies not only to colleges and police departments but to all types of business organizations.

Security contributes to job satisfaction, but we must remember that security is both social and economic, not solely economic. More important, security is relative, not absolute. Resignations occur in the civil service even though the positions carry tenure; furthermore, some people holding these jobs report greater insecurity than some industrial employees who have no guarantee of continued employment. Of course, it may be that insecure people seek civil service jobs and that their basic insecurities prevent their feeling any great job security. Adventurous and dangerous jobs are sometimes considered "secure" even when life itself may be in the balance. A physician is secure in his position and cannot be prevented from continuing in it (barring a few legal exceptions), but he has no guarantee that people will call him. The point is that security is a relative, not an absolute, concept.

Knutson (*10*) makes the interesting point that what some writers refer to as security or insecurity is defined by others as adjustment or maladjustment, high or low morale, and the like. He states:

> Personal security is a "dynamic" concept. People seek security within their various areas of striving: by achieving it, they become secure in some areas; by failing to achieve it, they become insecure in other areas. The areas of personal striving are interrelated and overlapping, and some may be of greater importance than others to the security of the individual. Feelings of security or insecurity may tend to become generalized throughout the personality structure, or they may be projected from one area of striving into others. Furthermore, the biological structure or physical or social environment of an individual, by limiting or influencing the character and direction of his motivations, may have a direct bearing upon the nature of his securities. In view of these conditions or possibilities, there appears to be a general level or status of security, as well as levels of security within the individual areas of striving.

A person's feelings of security or insecurity within any area of striving involve his own subjective evaluation of his success, satisfaction, and surety or confidence with respect to the carrying out of his purposes in past and present situations and group relationships, also, his expectations, hopes, fears, or uncertainties with respect to the carrying out of his purposes and aspirations in future situations and group relationships.

Feelings of security within any functional area vary on a continuum, so that security status within any area of striving or within any situation may be considered a matter of degree rather than a matter of absolute.

Knutson found that the patterns of security of very similar occupational groups are more alike than those of more distantly related occupational groups. This finding would lead to the speculation that job satisfaction may not be a unitary trait but that it may exist in some people when they are employed in certain occupations and not in others.

Loyalty is not to be overlooked in job satisfaction. The feeling that the worker has for his firm or boss, or both, contributes to job satisfaction. Although it is not likely to be as strong as the "school spirit" evidenced by loyal sons of Alma Mater, it is present in employees. It is the factor that leads people to sacrifice their own needs and purposes. It is the factor that prompts service beyond the line of duty in relation to job requirements.

Better to understand job satisfaction we must take into consideration the opportunities for satisfaction that the job itself affords the individual as well as the broader opportunities it offers him. The job satisfaction index rises with occupational level. Kornhauser (*11*) reports findings which have a bearing on this point. He asked four different economic groups seven questions dealing with personal satisfaction and in each instance found that the higher-income groups indicated greater personal satisfaction. The questions and answers in percentages are presented in Table 5.3, modified from his.

Each of these questions is directly or indirectly related to job satisfaction. Questions 2 and 4 are the only ones to which the majority of the lowest-income group gave favorable answers and yet they are of the essence of job satisfaction. This study is cited to show that if the economic range is great enough, salary may become a significant factor, but that with any one occupational group (i.e., Hoppock's teachers) or within a limited range it is a minor factor.

Morse (*15*) has published a book entitled *Satisfactions in the White-Collar Job*. It is based upon the interviewing of 742 clerical workers in a large insurance company. In addition, 73 first- and second-line super-

Table 5.3. Comparison of Groups in Personal Satisfaction Questions

| | Over $5000 | $2000 to $5000 | $1000 to $2000 | Under $1000 |
|---|---|---|---|---|
| 1. Do you feel that your children have as much opportunity as they should have? | 83 | 60 | 46 | 39 |
| 2. Do you like the kind of work you do? | 95 | 91 | 81 | 67 |
| 3. Do you feel that your pay is fair? | 90 | 69 | 53 | 34 |
| 4. Would you say that you are treated well by the people you work for? | 96 | 90 | 86 | 77 |
| 5. Do you feel that there is any danger of losing your job? | 89 | 80 | 72 | 49 |
| 6. Do you feel that you have as much opportunity to enjoy life as you should have? | 82 | 69 | 55 | 36 |
| 7. Do you feel that you have a good chance to get ahead in life and become fairly well off? | 96 | 78 | 69 | 43 |

visors were also interviewed. The data were obtained essentially from the following questionnaire, which was used as the basis of the interviews. It is included as a model for those interested in planning questionnaires on job satisfaction.

NON-SUPERVISORY QUESTIONNAIRE

1. What kind of work do you do on your job? (What do you actually do?)
   a. What is your job called?
2. How well do you like the sort of work you are doing?
   a. What things in particular do you like about the work you do?
   b. What things in particular do you dislike about your work?
3. When you are at work, does the time usually pass slowly or fast?
4. Do you make decisions on the job you are doing?
   a. Would you like to have a job in which you make (or more) decisions? Why or why not?
   b. Would you like a job where you supervise people? (Why?)
5. Do you get any feeling of accomplishment from the work you are doing? (Do you get a feeling of satisfaction from getting things done or do they seem to go on and on?) (probe for task completion)
6. How is your job considered by people around here; does it rate as an important job? How do you feel about it?
7. How does your work tie in with the whole work of the Company? (if answer in procedural terms, repeat the question)
8. Does your job give you a chance to do the things you feel that you do best? (if no, Why is that?) (don't accept just likes about the job)
   a. In what ways?
9. So far, we've been talking about your present job. What were your plans and ambitions before you started working?
   a. What happened? (How have things worked out for you?)

b. What are your plans and ambitions now? (if plans and ambitions have changed, probe for continued attachment to original plans and ambitions) (if plans to marry eventually—If you don't get married for some time, what do you expect to do until you do marry?)
c. Do you think anything you are doing right now is leading up to that?
d. What do you expect will really happen about your plans and ambitions?

10. Why did you decide to come to work for this Company?
11. How do you like working at the Company?
    a. What do you like best about it?
    b. What do you like least?
12. How do your friends and family feel about your working for this Company? (probe for friends and family separately)
13. How long do you expect to be working at this Company?
14. Would you advise a friend of yours to come to work for the Company? Why?
15. What kind of a place is this Company to work in as far as working conditions go? (I mean as far as physical conditions are concerned.) (How comfortable a place is it?) (In what ways?)
16. How do you feel about the Company furnishing lunches for all employees?
17. How do the hours at the Company compare with other large companies in this area? (not just beginning and ending hours) How do you feel about that?
18. What is the Company policy toward discharging or firing employees?
    a. How do you feel about this?
19. What about employee benefits? How do they work?
    a. How does the vacation system work?
    b. What about sick leave and disability?
    c. What about employee insurance?
    d. Are there any other employee benefits? What are they and how do they work?
20. How much part do you take in the athletic and recreational activities of the Company?
21. Have you ever submitted a suggestion to the Company?
22. Do you feel that you get enough accurate information about what is going on in the Company?
    a. How do you get most of this information?
23. Do you see . . . (Company magazine)?
    a. How often do you read it?
    b. How much of it do you read?
24. Since you've been working here have you taken any courses related to your work?
    a. What courses have you completed?
    b. Did you find them worthwhile?
25. How well do you think your section compares with other sections in this Company in getting the job done? (if in a set, How about your set?) Why do you feel that way?

26. How well do you think your division compares with other divisions in the Company in getting the job done?
27. Who is your immediate boss? (get title) (Who gives you work and tells you what to do about it?)
    a. What kinds of things does he (substitute title) supervise you in?
    b. Are there other people who supervise you? Who? (for each supervisor mentioned) In what ways?
    c. Are there others?
28. How do you feel about your immediate boss? (title of supervisor)
    a. Does he take much personal interest in the people you work with? (probe for each supervisor mentioned)
    b. How about your own case? How much interest does he take in you? (probe for each supervisor mentioned)
29. How do you feel about the manager of your division?
    a. Have you ever been in to talk with your manager or assistant manager? How often?
    b. How do you feel about the idea of having talks with the manager or assistant manager?
30. How much does your supervisor (section head level) stand up for the people you work with? (work assignments and overtime, promotions, transfers and getting changes made in the work)
31. How do you feel about what your supervisor expects of you?
32. Do your supervisors discuss matters with your group before deciding what to do about things that come up? How? What kind of things? (probe fully —find out if group's participation has an effect on decisions)
33. How well does your supervisor explain the new jobs or methods (systems) that come along?
    a. Does he tell you the reason for the job or change in method? (What kinds of reasons?)
34. How do you feel about the way you were taught your job? How is that? In what way?
35. How could the training be improved?
36. In your opinion how good a job does the Company do in placing people in jobs they can do best? (not only initial placement) (if just good or bad, get explanation)
37. How do you feel about the rules (things you are supposed to do or not do) for the people in your group?
    a. How do you feel about the way these things are handled in your group as compared to other groups or sections?
38. How do you feel about the rating system?
39. How are complaints, or problems which individual employees have, handled?
    a. How do you feel about the way complaints are handled?
40. How well satisfied are you with your present salary? Why?
    a. (if dissatisfied) How much do you think you should be getting?

41. How satisfied are you with your chances of getting more pay at the Company?
42. Do you know what the maximum salary is for your job?
43. How do you feel about overtime work? (if dislikes—probe for reason)
44. How does a person get ahead here at the Company?
    a. What do you feel is the most important thing in getting ahead here?
    b. How about your own case, how satisfied are you with the way things have been working out for you?
45. Do you expect to be doing this same job very long?
46. Do most of your friends work here or are they outside the Company? (if former) Are they the people you work with?
47. What kind of group spirit or morale is there in your office?
48. How do the people you work with feel about the person who turns out more work than anyone else?
49. How do the people you work with feel about someone who does less work than anyone else?
50. How much do the people you work with help one another in getting a job done on time? (How much? What kind?)
    a. Who decides what girl will help another?
51. In many offices there is some one person other than the boss to whom people go to find out what the score is or for real information about what goes on. Is there a person like that in your office?
    a. Do people often go to him?
    b. How does the supervisor feel about this?
52. How well do your family and friends like to hear about things that happen here at work? What kinds of things? (probe for family and friends separately)
53. If you inherited some money and had enough to live on without working would you want to work anyway? Why?
    a. Would you stay on here at the Company?

Face Sheet
For Single Girls Living at Home
Name of Interviewer:
Date of Interview: Interview Number:
Time of Interview: Hrs. Min.
Division Name: Salary
Section Name:
Marital Status: Married Single Widowed
Divorced or Separated:
Sex: Male Female Age:
Place of Birth: City or Town
State: Country:

Where was your father born?
Where was your mother born?

Education: What was the last school you attended?

Did you graduate?

| High Sch. yrs. comp. | High Sch. Graduate | Bus. or Trade Sch. (yrs.) | College yrs. comp. | College Graduate |
|---|---|---|---|---|
| | | | | |

1. How many children are living at home?
   Under 18 Over 18
2. Do you support yourself fully?
   Yes: No: Partially:
3. Do you support any other person? Partially (No.)
   Fully (No.) How many?
4. Does your family own or rent your home?
   Own: Rent:
5. What is your father's occupation?
6. How much does your father make?
7. Do you get money from other sources besides your salary?
   Source: How much:
8. How do you like the particular community in which you live?
   Likes: Dislikes:
   Indifferent:
9. Has housing been any problem for you and your family?
   Satisfied: Dissatisfied:
   Indifferent:
10. Do you have much trouble getting to and from work?
    Very difficult: Difficult: Not Difficult:
11. How long does it take you to get to work?
    From work?
12. Have any members of your family ever worked for the Company?
    Who? When?
13. What jobs have you held in the Company? Begin with your present job, tell what dates you have been on it, what your starting pay was and your last pay on the job.
    Job Title Dates Held Salary

    (Record if worked at Company in part time job prior to getting full time job)
14. What job or jobs did you hold before entering the Company? (Do not include summer jobs held while in high school.)
    Job Title Dates Held Salary

    (Record if worked at Company in part time job prior to getting full time job)[1]

[1] Reprinted from Nancy C. Morse, *Satisfaction in the White-Collar Job*, Ann Arbor, University of Michigan Press, 1953, pp. 179–185.
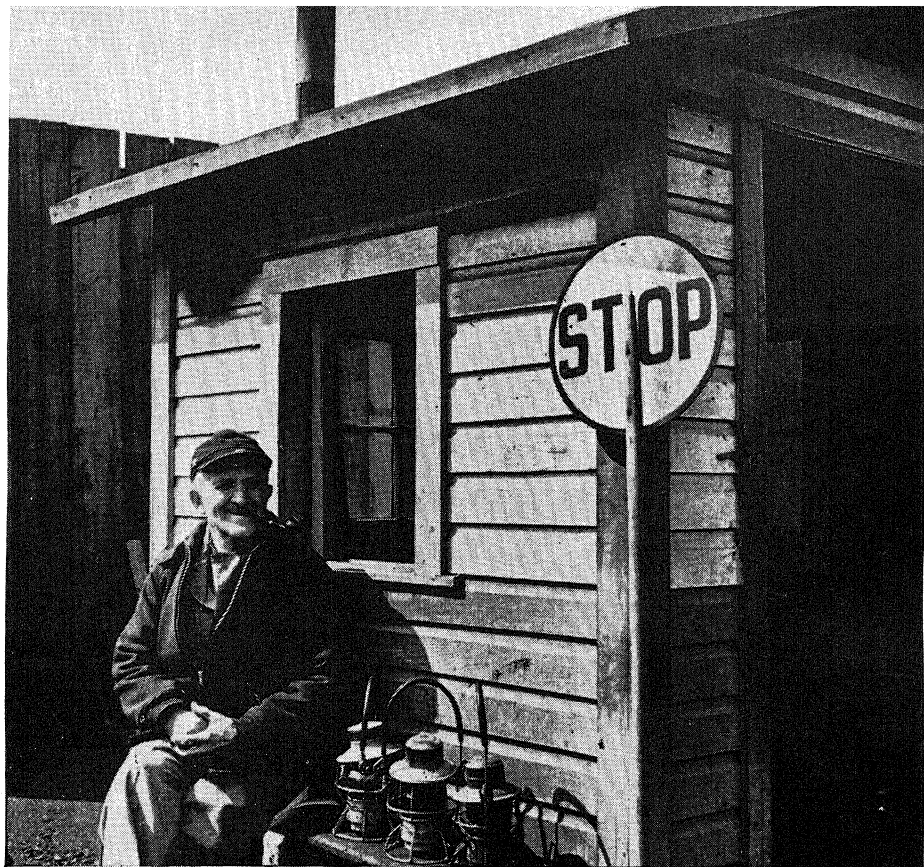
*Figure 5.3.* The Hypothesis Is Advanced That Satisfaction Depends Basically upon What an Individual Wants from the World and What He Gets. (Courtesy of Standard Oil Co. [N.J.].)

As a result of this study the hypothesis is advanced that satisfaction depends basically upon what an individual wants from the world and what he gets. See Figure 5.3. Morse developed four indexes of job satisfaction. The first is related to content of the job, the second is related to identification with the company, the third is related to financial and job status satisfaction, and the fourth is related to pride and group performance. While it must be clearly stated that an author is as an author does, the point of view expressed in this text is to refer to job satisfaction as the resultant of the sum total of individual attitudes, and to refer to morale as a group factor. Morse apparently considers job satisfaction and morale as interchangeable concepts. To be more correct, she considers morale to be a combination of three of her indexes of job satisfaction, namely, job content, company involvement, and pay and job status. However, at another point she describes the degree of group spirit as equal to morale. While it is not important for present purposes to get involved in the problem of semantics, it nevertheless is important for an author to be consistent in definition as well as in application.

One of the underlying generalizations offered by Morse is that level of satisfaction is a combination of both level of aspiration or need-tension level and amount of return from environment. Satisfaction exists when these two are in line, and job dissatisfaction exists when the return from the environment is much less than the need level of the individual. Morse found that productivity and employee satisfaction did not necessarily go hand in hand. This is similar to other findings of the Michigan group on section gangs on a railroad and factory workers in a tractor plant. All three studies find that high producers do not differ significantly from low producers in overall satisfaction with their employment.

Only one who is naïve or who makes unguarded and unwarranted assumptions would expect to find job satisfaction and production related in a cause-and-effect relationship. This view is what might be called "unseasonable sweetness"—that is, all good things should be expected to go together. Since job satisfaction is a good thing and so is high production, the two ought to go together. High production, however, may be an employer's goal and job satisfaction may be an intrinsic quality in an employee. Many instances can be cited from everyday experience where people who are very job-satisfied are not necessarily the high producers. It may well be best to regard job satisfaction as an entity in itself, which may or may not be related to production. Just as one might hope to find that beauty and intelligence go together, sometimes they do not, although sometimes they do.

Schaffer (*17*) has proposed the theory: "Over-all satisfaction will vary directly with the extent to which those needs of an individual which can be satisfied in a job are actually satisfied; the stronger the need, the more closely will job satisfaction depend on its fulfillment."

Schaffer investigated 12 needs, using as his sample 72 employed men, most of whom were in the professional and semiprofessional occupational groups. He found that two clusters appeared. One contained needs which were passive or hostility-restraining in nature, and the other contained the assertive, aggressive needs. A high correlation existed between the person's two strongest needs and overall satisfaction. Among the strongest needs reported in this sample were creativity and challenge, mastery and achievement, and helping others.

Morse's work and Schaffer's work seem to point to the view that job satisfaction depends upon the fulfillment of personal needs. Such fulfillment may not at all depend upon productivity as measured by the number of units turned out and therefore the expectation that increasing job satisfaction increases productivity may be a "Pollyanna" approach to the reality that does exist.

Weitz (*25*) raises an interesting point that a measure of general satisfaction of an individual should be taken in relation to that individual's job satisfaction. He offers a number of hypotheses such as "those who have high general dissatisfaction scores and a large number of job dissatisfactions are less likely to quit than those who have low general dissatisfaction scores and a large number of job dissatisfactions; other combinations are obvious, such as high general dissatisfaction–low job dissatisfaction (less likely to quit), etc."

Granted that we should know with what job satisfaction correlates. However, while we may hypothesize, we should not glibly expect job satisfaction to correlate with arbitrary and assumed external criteria. We may expect job satisfaction to correlate with length of employment and production but under certain conditions this expectation may be impossible of attainment. Both production and length of employment may be employers' goals and cited as measures of success. However, these two criteria are not correlated to any perfect extent with each other. Blum's finding (*1*) that production and length of employment correlated +.44 would indicate that each is measuring a somewhat different aspect of success on the job.

Severin (*20*) points out that care should be used in substituting one criterion for another since the median correlation of job performance criteria with various other criteria is about +.30. It is clear that criteria

correlate with one another variously and some are more equivalent to each other than are others.

In a market of many jobs the more productive workers may leave to take better jobs and the poorer ones will stay on. Job satisfaction may therefore contribute to the less productive workers' remaining while it may be that the more productive workers, regardless of job satisfaction, took advantage of the better job opportunity.

Whether job satisfaction is related to termination may depend to a large extent on employment conditions and the availability of other jobs. Therefore, the correlation between job satisfaction and termination may exist in one type of employment market and not in another.

Studies comparing job satisfaction with such criteria as termination and production may result in erroneous conclusions. It is necessary to be aware that many hypotheses can exist concerning the relation between job satisfaction and production and/or termination or any other stated criterion. The hypothesis offered here is that job satisfaction can bear various relations to production depending upon a host of factors not usually even considered by some psychologists and their studies. For example, a correlation is computed as a result of taking a measure of production at a particular time. It is clear from studies investigating production that it varies from ones period to another. In other words, production in the long run may differ from production in the short run—and which should be regarded as the "truer" measure? If they differ, then each bears a different relationship to job satisfaction.

It is most important to establish what is meant by job satisfaction or dissatisfaction and *then* to measure it. If what is meant by job dissatisfaction is the number of gripes that a person has on a job, it may not be correct to assume that the person who gripes will necessarily leave the job. It may happen that the griper is competent and feels free to gripe whereas the person who is unsure and is afraid to gripe may leave the job because he is really dissatisfied. This, again, may be cited as an example of "unseasonable sweetness." The fact that a psychologist establishes a correlation between two concepts does not mean that he established a cause and effect. Further, it does not mean that this correlation would continue if any variable in addition to the two being measured were to change.

Research findings often lead to meaningful hypotheses, but they must also be mixed with reality. Many times the researcher will be stumped by the meaning of his results. All he has to do is ask the secretary or the

factory worker involved to explain the phenomenon and the answer is forthcoming immediately.

Kates (9) found that there was a positive correlation between scores on the Strong interest blank and job satisfaction in clerical workers but did not find that the expression of job satisfaction bore any relation to Rorschach signs of adjustment or maladjustment of these same clerical workers. He also found that the higher the score on the clerical scale of the Strong blank, the more numerous were the signs of personality maladjustment as determined by Rorschach respondents. This would mean that routine clerks may be satisfied with their jobs despite Rorschach's signs of maladjustment. This finding does not allow the generalization that routine clerks who are satisfied on their jobs are emotionally maladjusted. It merely means that the possibility exists that individuals may

Table 5.4. Reasons Why Workers Preferred One Job Rather Than Another (in Percentages)

| Reason | Watson Study Men | Watson Study Women | Seidman-Watson Study Young Men |
|---|---|---|---|
| Congenial work conditions and social contacts | 21 | 38 | 24 |
| Responsibility, initiative, prestige | 27 | 23 | 19 |
| In line with vocational aspirations | 15 | 13 | 29 |
| Variety | 15 | 12 | 12 |
| Salary | 13 | 6 | 4 |
| Shorter hours | 3 | 6 | 4 |

have satisfaction in one area in relation to their personality structures, and if these people were working in different areas, they might have dissatisfactions. Thus it is unsafe to live in a naïve world and assume that all "good" things ought to go together, and if they do not, then there is something wrong.

Goodwin Watson (23) has conducted a few studies in job satisfaction, the results of which are summarized here to shed additional light on the role of salary as a factor in job satisfaction. He states, "Without in any way denying the need of many workers for higher wages, it may be recognized that sometimes workers, vaguely dissatisfied with the way things are going, know no other way of meeting the situation. They ask for more pay or shorter hours, and perhaps they should have these, but if these demands were attained, the relief would be only temporary. The underlyi

cause of dissatisfaction may be not in the pay envelope or the time clock, but in the work itself."

In this study, and in a similar study by Seidman and Watson (*19*), a sampling of men and women were asked to report on the job previously held which was most satisfactory to them and to give the reasons for their selection. The results, which are shown in Table 5.4, present further evidence that recognition, friendly associations, work fitted to vocational level, and variety of duties are more important contributing factors in job satisfaction than salary.

This same problem was approached from a slightly different angle by Watson and Seidman (*24*) and Seidman (*18*). In these studies, unemployed adults were asked, "If you feel that you weren't entirely successful on some of the jobs you have held, to what do you attribute that fact?" The answers, given in percentages in Table 5.5, show again that the nature of the work, congeniality of working conditions, and social contacts are more conducive to work satisfaction than wages and working hours. These four studies of Watson and Seidman corroborate other findings and lead to the conclusion that wages are not the most important factor in job satisfaction.

Table 5.5. Reasons Given for Work Dissatisfaction (in Percentages)

| Reasons | Seidman Study Men | Seidman Study Women | Watson-Seidman Study |
|---|---|---|---|
| Deficiencies within self (personality) | 32 | 41 | 24 |
| Nature of work; monotony | 35 | 20 | 47 |
| Uncongenial work conditions | 11 | 9 | 9 |
| Lack of education and experience | 7 | 20 | 9 |
| No promotion opportunity | 5 | 1 | 9 |
| Ill health | 4 | 5 | 0 |
| Social and economic conditions | 4 | 3 | 0 |
| Low wages | 1 | 1 | 1 |
| Long hours | 1 | 0 | 1 |

A review of the material presented thus far in this chapter, and of that in the preceding chapter, should make it clear that job satisfaction can be measured in one of two ways. One method is to investigate the specific factors on the job and the resulting attitudes. The other, which is much more comprehensive, includes the overall factors that contribute to satisfaction in life. Neither method is necessarily right or wrong. However, progress can be made in this important field only after there is an under-

standing of the many factors which are involved and when research findings are reported in such a way as to allow meaningful comparison. For example, one who wanted to measure intelligence could not do so by making up six or eight or even eighty questions and assuming that they would measure intelligence, because the present development of intelligence testing would make such a process completely foolish. But pretty much the same thing is being done in measuring job satisfaction at the present time, and we are congratulating ourselves on our own good judgment in the firm belief that the other fellow does not really know what it is all about.

### Measuring Job Satisfaction

Either of two approaches will lead to uniformity of concluusion in regard to measuring job satisfaction. A business organization may use either one, depending on its problem. If it believes that it is limited in the things it can do about job satisfaction, it can limit its investigation accordingly. In this case there is little reason for it to make a deep motivation analysis of its employees. If, on the other hand, it is concerned with broader aspects of job satisfaction, the survey must include information related to vocational guidance and selection.

#### SCALE METHOD

In solving the problem as it affects the first part of the definition of job satisfaction, a good starting point is the work of Walter A. Woods (*26*). Although there is ample room for disagreement as to whether the scale that he proposes measures morale, it does appear that the 17 areas he suggests are concerned with specific factors in job satisfaction. The statements in each area, together with their scale values, are presented in Table 5.6. The scale values were determined by the ratings of the 68 men who supervised the workers. These values are not to be accepted as necessarily correct because, as has been pointed out, a supervisor's attitude about an employee attitude is not the same thing as the employee's attitude. Another technical difficulty arises from the fact that this scale is too heavily weighted in the extreme value statements and does not present a sufficient number of neutral opinions. Many of the statements have rather similar scale values; hence those that overlap have been omitted. A further modification is relatively minor and involves the title which has been given to each of the areas.

The primary reason for including the modified Woods Scale is to sug-

Table 5.6. Modified Woods Scale to Measure Job Satisfaction

You are asked to check the one statement in each of the following groups which most closely represents your opinion.

| | Scale Value |
|---|---|
| **I. *Job Instructions*** | |
| 1. If instructions conflict the employee should seek the advice of his immediate supervisor at once. | 8.3 |
| 2. Our supervisors always appreciate the employee's point of view regarding instructions. | 7.9 |
| 3. I feel that I receive too many instructions that are meaningless. | 2.7 |
| 4. There is no use following all instructions too carefully for some supervisors do not understand the details of the job. | 2.3 |
| 5. Instructions are often unimportant and should not be taken too seriously. | 1.3 |
| 6. Instructions don't mean a thing for the supervisors do not know the job. | 0.3 |
| **II. *Assuming Responsibility*** | |
| 1. It is always a pleasure to assume responsibilities here. | 8.9 |
| 2. It will benefit an employee to assume responsibilities whenever possible. | 8.4 |
| 3. It is to the employee's best interest always to assume responsibilities when necessary. | 7.7 |
| 4. The supervisors rather than the employee get paid for taking on responsibilities. | 3.2 |
| 5. The officials do not expect employees to assume responsibilities so they shouldn't assume any unnecessary risks. | 2.6 |
| 6. It is always best to let others assume responsibilities for nothing is gained by taking unnecessary risks. | 1.3 |
| **III. *Suggestions*** | |
| 1. Employees here are always anxious to make constructive suggestions about their work. | 8.4 |
| 2. There are times when constructive suggestions are appreciated. | 7.4 |
| 3. Constructive suggestions would not be appreciated here. | 2.1 |
| 4. It is not worth while to offer suggestions on how to improve the work. | 1.3 |
| **IV. *Supervision*** | |
| 1. Our supervisors are capable men. | 8.7 |
| 2. The officers have earned their positions by being good administrators. | 8.5 |
| 3. Most of the officers are good men but there are a few who aren't. | 6.9 |
| 4. There are a few good fellows among the officers. | 4.7 |
| 5. If the supervisors were more capable they wouldn't be criticized so much. | 2.1 |
| 6. The officers would be better liked if they didn't act like they were so much better than anyone else | 1.0 |
| 7. The officers would be better liked if they weren't such a bunch of capitalists. | 0.7 |
| **V. *Knowledge of Management Plans*** | |
| 1. It will help the organization if the employees try to keep acquainted with the plans of the management. | 8.0 |
| 2. It is to the employee's interest to keep acquainted with the plans of the management. | 7.1 |
| 3. It makes very little difference whether the employee shows interest in the plans of the management. | 2.3 |

Table 5.6 (*Continued*)

| | Scale Value |
|---|---|
| 4. I can't be bothered with so-called plans of the management. | 0.8 |
| VI. *Work Meaning* | |
| 1. The work we are doing is really a great service to mankind. | 8.8 |
| 2. The public should be encouraged to support the work we are doing. | 7.4 |
| 3. Our work is not so important but somebody has to do it. | 2.7 |
| 4. The work we are doing is one of those necessary evils. | 1.8 |
| 5. Our work is really a racket. | 0.6 |
| VII. *Employee Co-Relations* (A) | |
| 1. It is a pleasure to do favors for fellow workers here. | 8.7 |
| 2. An employee should, if necessary, go out of his way to help fellow employees. | 7.6 |
| 3. Employees should do favors for each other. | 7.3 |
| 4. It is all right to do favors for fellow employees if they have done one for you. | 4.9 |
| 5. It is all right to do a favor for a fellow employee now and then. | 4.3 |
| 6. If you start doing favors for fellow employees you will soon be imposed upon. | 1.3 |
| 7. Nothing is gained by doing a fellow employee a favor. | 0.6 |
| VIII. *Employee Co-Relations* (B) | |
| 1. It is a pleasure to be courteous to the kind of employees we have here. | 9.0 |
| 2. It is wise to treat fellow employees courteously. | 8.0 |
| 3. It is generally a good practice to be courteous to fellow workers. | 7.3 |
| 4. It doesn't do any harm to speak to fellow employees but it isn't necessary. | 2.6 |
| 5. There is no need to be particularly courteous to fellow employees. | 2.3 |
| 6. It is best to avoid speaking to fellow employees as much as possible. | 1.2 |
| 7. It helps bring fellow workers around to snub them now and then. | 0.6 |
| 8. Fellow employees here deserve to be snubbed. | 0.3 |
| IX. *Employee-Public Relations* | |
| 1. We are all proud of our organization and its work and are anxious to have the public think well of us. | 9.1 |
| 2. Employees should be courteous to the public whenever possible. | 8.1 |
| 3. It really saves time and trouble to explain things fully to everyone who has dealings with the organization. | 7.8 |
| 4. In dealing with the public you just have to make it snappy or you will never get your work done. | 4.1 |
| 5. Some of the folks who come into this office are pests and you can't waste too much time on them. | 2.5 |
| X. *Job Attitude* | |
| 1. I wouldn't change jobs with anyone. | 9.1 |
| 2. I like the work here because it is so interesting. | 8.9 |
| 3. There is no reason to object to a job in this organization. | 7.6 |
| 4. I would like my job better if there were any future in it. | 4.4 |
| 5. An employee here cannot be blamed for looking for a better job elsewhere. | 3.0 |
| 6. This work is so trying I am really glad when it is time to quit. | 1.2 |

Table 5.6 (*Continued*)

| | Scale Value |
|---|---|
| 7. The work is so monotonous I'm glad to forget about it after quitting time. | 0.7 |
| 8. I really hate this job but what can one do about it? | 0.5 |
| XI. *In-Service Training* | |
| 1. The management offers the employee unlimited opportunity for training to improve his work and service. | 8.9 |
| 2. The management makes it worth while for an employee to improve his training. | 8.0 |
| 3. Political pull rather than training makes for advancement here. | 1.5 |
| 4. There is little use in bothering with outside training for the management has most of us pegged where it wants us. | 1.1 |
| XII. *Career Opportunity* | |
| 1. This organization offers ideal opportunities for a career. | 8.9 |
| 2. This work has many features which makes it worth while as a career. | 7.7 |
| 3. If one were interested in a career he would not stay here too long. | 2.4 |
| 4. As a career this job has absolutely nothing to offer. | 1.3 |
| 5. The career boys here are the ones with a drag. | 1.0 |
| 6. There is no use in my thinking of a career; things are set against me. | 0.1 |
| XIII. *Compensation* | |
| 1. Employees here are well paid in proportion to their ability. | 8.3 |
| 2. The best way to get a raise is to tend to business. | 7.8 |
| 3. The most able employees are not always the best paid. | 4.2 |
| 4. You never get a raise here until you ask for it. | 3.3 |
| XIV. *Work Environment* | |
| 1. Our working conditions here are ideal. | 9.4 |
| 2. Working conditions here aren't so bad. | 6.6 |
| 3. There are many things that can be done to improve our working conditions. | 4.8 |
| 4. How can the management expect us to get anything done under the conditions in which we are presently working? | 2.5 |
| 5. Working conditions here couldn't be much worse. | 0.6 |
| XV. *Work Recognition* | |
| 1. The employees here appreciate the credit that is gladly given by the management for good work. | 8.9 |
| 2. The management is fairly good about recognition of work done well. | 7.1 |
| 3. Sometimes credit is given for good work here and sometimes not. | 4.3 |
| 4. You may as well take advantage of the other fellow's good ideas to get credit for yourself, that's what everyone else does. | 1.0 |
| XVI. *Promotion* | |
| 1. The chances for promotion are ideal here. | 9.1 |
| 2. Employees are always given plenty of opportunity for promotion. | 8.5 |
| 3. The best-qualified people always get the promotions here. | 7.7 |
| 4. If a fellow isn't fitted for the job he should refuse a promotion. | 6.1 |
| 5. More employees would stick with the organization if the chances for promotion were better. | 4.4 |

Table 5.6 (*Continued*)

| | Scale Value |
|---|---|
| 6. The best-qualified people do not always get the promotion. | 4.1 |
| 7. There are a few opportunities for promotion, but generally they aren't so good. | 3.2 |
| 8. It doesn't pay to work hard for promotion here for there aren't any opportunities anyway. | 2.3 |
| 9. It seems to make little difference whether an employee works hard to earn a promotion. | 1.9 |
| 10. Promotions are a matter of luck and political pull. | 0.9 |
| XVII. *Outside Factors* | |
| 1. The management has been very considerate on occasions when I was having problems and worries outside the line of duty. | 8.5 |
| 2. An employee should always try to keep outside influence from affecting his work. | 8.3 |
| 3. There is nothing the matter with the job here, I am just worried by some conditions outside the line of work. | 5.3 |
| 4. I haven't been able to do my best because so many other matters were troubling me. | 3.9 |

gest that these 97 statements might be incorporated into a job satisfaction scale and that eventually a standard measure might be derived from them. They could be included as one group instead of being separated into subgroups, and they should be presented without scale values and in random order. A group of employees could be given the scale; an analysis of the results would inform management as to how it stood in each of the specific areas, and also give a composite picture of the individual employee's satisfaction with his job.

Another type of approach is to study job dissatisfaction factors as manifested by employees who are no longer on the job. One such survey was conducted by a company. Whether the results obtained are typical or atypical of a total population can be only conjectured. The results, however, can furnish interesting leads and are presented in Table 5.7.

Table 5.7. Percent of Ex-Employees Expressing Dissatisfaction

| Area of Dissatisfaction | Percent of Ex-Employees |
|---|---|
| Lack of advancement | 51 |
| Compensation | 47 |
| Hours | 46 |
| Territory | 45 |
| Training | 40 |
| Supervision | 30 |

These findings indicate that no one single factor is responsible for dissatisfaction and that at least four areas, namely, advancement, compensation, hours, and territory, are rather closely grouped together.

Much additional work is needed in this field since understanding the negative aspects of work can lead to greater emphasis on the positive phases of job satisfaction as well as encourage attempts to eliminate or minimize the negative aspects.

#### PREDICTING JOB SATISFACTION

The second method proposed for measuring job satisfaction includes the individual and his adjustment and is used in the personnel department at the time of hiring. This method assumes that a person is predisposed to job satisfaction or dissatisfaction prior to being employed, and hence strikes at the core of the problem. It demands that all applicants be screened, a process which provides measures of the individual's intelligence, abilities, interests, and personality, at least to the extent of emotional stability.

Adjustment on the job, according to this method, is dependent upon the individual's abilities, interests, and personality. When the specific job factors are related to his make-up, job satisfaction is possible. But when they clash, there is job dissatisfaction, and the extent of the clash determines the depth of the dissatisfaction. After all, few people are likely to understand the problem in relation to their own limitations; it is much easier to avoid undermining the self and instead to ascribe the trouble to some outside factor such as the job.

The numerous studies on the relation of intelligence test scores and job performance suggest that for a particular occupation a score within a certain range is likely to be best. That is, a person may have either too much or too little intelligence to do a job successfully. Obviously it is poor employment procedure always to hire the individual with the highest intelligence, regardless of the job; this usually results in considerable harm to both the individual and the job. As long ago as 1918, the Army Alpha testing program established that scores on intelligence tests varied according to previous occupation; Table 5.8 presents a portion of the findings reported by Douglas Fryer (*5*). Although each of the selected occupations has a considerable range and there is overlapping from occupation to occupation, the hierarchy is plainly established.

Considerable differences are to be found within the same occupation. For example, Miner (*14*) reports that salesmen for a technical product

Table 5.8. Occupational Intelligence Standards

| Occupation | Average Score | Range of Scores of Middle Fifty Percent of Population (25 percentile to 75 percentile) |
|---|---|---|
| Engineer | 161 | 110–183 |
| Accountant | 137 | 103–155 |
| Chemist | 119 | 94–139 |
| Dentist | 110 | 80–128 |
| Clerk (office) | 96 | 74–121 |
| Conductor (railroad) | 83 | 64–106 |
| Electrician | 81 | 57–109 |
| Druggist | 78 | 61–106 |
| Toolmaker | 67 | 50–92 |
| Carpenter | 60 | 40–84 |
| Barber | 55 | 34–78 |
| Teamster | 50 | 30–72 |
| Mason | 40 | 19–60 |
| Shoemaker | 35 | 19–57 |
| Leather worker | 30 | 16–41 |
| Textile worker | 26 | 18–60 |
| Fisherman | 20 | 15–51 |

averaged 27 more points on an intelligence test than insurance salesmen. In turn, insurance salesmen averaged 23 more points than wholesale salesmen, but the latter scored on the average 33 more points than retail salespeople. According to Snow (*21*), duller individuals showed least dissatisfaction in highly repetitive work; but when the work was fairly complex, considerable dissatisfaction was manifest. Further reference to this topic will be made in Chapter 14; the point to be stressed here is that an employee's intelligence is a factor in predetermining his job satisfaction. Too much intelligence—that is, more than the job requires—may well lead to dissatisfaction. Similarly, too little will make the job prove too much of a challenge and this may also lead to dissatisfaction.

This brief discussion of intelligence tests and job satisfaction should not lead to the assumption that there is necessarily a high correlation between such tests and job achievement. Nothing is further from the truth. The subject is introduced solely to suggest that maximum and minimum scores often furnish a lead regarding job satisfaction.

There are other abilities and aptitudes which can furnish similar clues. The previous job history is highly informative and should not be over-

looked. Most employees who stay on a job from six months to one year can be assumed to be capable of doing the job. A person who does not have the required ability will find the job frustrating and leave it. When a job history is not available, as is often the case with young applicants, a battery of psychological tests to measure clerical ability, mechanical ability, and abilities in many other fields is often helpful. Tiffin and Greenly (*22*) report a correlation of +.63 between scores on a hand precision test and foremen's ratings of a group of electrical fixture assemblers. Blum (*1*) finds a correlation of +.39 between a combined finger and tweezer dexterity score and earnings in a group of watch factory workers. Cook (*2*) found that only 8 percent of the average group failed a coil winding test, whereas 72 percent in the below-average group failed it. Crissey (*3*) points out that among test-selected employees the turnover for personal reasons is 5 percent, as against a turnover of 12 percent for non-test-selected employees. He says further that those who score in the high third on a battery of tests maintain high production and contribute greatly to the improvement of employee morale on the job.

In addition to intelligence and other abilities, interest in the work contributes to job satisfaction. When a person's interests are in line with the job, he can be expected to be absorbed in the job. On gross analysis, interest can be divided into two categories: interest in people and interest in things. Individuals in the first group find the greatest outlet for their interests in jobs that essentially involve people—salesmen, lawyers, teachers, etc. People in the second group, on all levels from factory worker to the professional electrical engineer, find their maximum outlet in jobs which require designing or producing articles, tools, etc. More minute measurements of specific interests in relation to varieties of jobs are afforded by such test inventories as those constructed by Strong, Brainard, and Kuder.

A somewhat difficult question is the relation between interest and ability. In some respects, this is not unlike the famous "chicken and egg" problem, for it is probably true that in some cases the interest comes first but in other cases it grows out of an aptitude. Nevertheless, it is generally agreed that although the two are different, they tend to go together; the correlation between them is usually found to be +.50.

Last but not least of the contributors to job satisfaction is personality. One of the dimensions of personality is emotional stability—or "neurotic tendency." An individual's emotional stability is likely to manifest itself in satisfaction or dissatisfaction in a specfic job. According to Fisher and

Hanna (4), "a large part of vocational maladjustment and industrial unrest are secondary to, and but a reflection of, emotional adjustment."

It is very likely that when everything is going smoothly the emotionally stable and the unstable show little difference on the job. However, when the pressure is on and difficult situations develop, petty annoyances take on major significance. It may well be that the individual reacts to these situations in proportion to his stability. The person who "flies off the handle" seems to go to pieces every time. The supervisor's choice is whether to ride out the situation or avoid it. Supervisors often say, "I can't tell him anything because he will get excited and rave," or "If I call the error to that girl's attention she will cry and then I'll be in a mess." What is really being said is that such people are emotionally unstable, even if the supervisors do not know the term or do not recognize the concept when it is called to their attention. A further characteristic of the emotionally unstable is the degree to which they allow one situation to affect a totally different situation. Thus a slight exchange of words with a co-worker can have the individual "tied up in knots" not only on the job but even at home after the day's work is done. Similarly, such a person will bring a home situation to the job much more often than a stable individual will.

Security must also be considered as an important dimension of personality as it affects job satisfaction. Our earlier discussion of job security suggested that security was a relative rather than an absolute concept, that security is an attribute of the individual. An insecure person will remain insecure even though his job is secure. Family background and many similar factors contribute to individual security.

One additional factor about the individual which must be taken into consideration if there is to be a complete understanding of job satisfaction is his adjustment to his life. Has his schooling led to satisfaction or dissatisfaction? This holds also for friends, hobbies, marital status, and all the other adjustments that the normal person makes adequately and with satisfaction. If the individual has a long list of "gripes" about being "done wrong," it is probable that sooner or later—probably sooner—he will find gripes and accompanying dissatisfaction in the job.

## Summary

Job satisfaction is a generalized attitude resulting from many specific attitudes in three areas: specific job factors, individual adjustment, and group relationships. Industry has been primarily concerned with measuring attitude in the first area. Although there is considerable justification

for this approach, many of the studies have not been concerned with the development of measuring instruments that are capable of withstanding the rigors of scientific standards; therein lie their shortcomings. A more fruitful approach is not only to measure attitudes toward specific job factors but to try to deal with job satisfaction at the source of employment and to match jobs more carefully with the individual's intelligence, abilities, interest, personality characteristics, and previous adjustments.

More recent research points to the desirability of considering an individual's need level and the return from the environment as a means of estimating and predicting job satisfaction.

It is hazardous to expect to validate job satisfaction by correlating it with such external and possibly arbitrary criteria as termination or production. The term "unseasonable sweetness' may be used to explain the naïve approach of expecting all "good" things to go together.

Job satisfaction is an individual phenomenon and is measured by ascertaining certain attitudes. Whether it correlates with certain assumed or stated criteria depends upon a host of realistic factors but does not depend upon assumed expectations. Possibly job satisfaction will correlate with an integrated combination of such factors as termination, production, and many similar ones, but only in the way these factors have meaning to the individual.

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CHAPTER 6

# Industrial Morale

**MORALE** is a term usually applied to civilian populations and armies during wartime, its conspicuous presence or absence often being considered vital to the outcome of the war. The term is also applied to athletic teams, and here also it can contribute to success. Sport fans know that high morale can overcome many obstacles and physical disadvantages. The term is similarly applied to industry. Of late, the concept of industrial morale has received considerable attention on the part of management.

Industrial morale was defined in the preceding chapter as the possession of a feeling, on the part of the employee, of being accepted and belonging to a group of employees through adherence to common goals and confidence in the desirability of these goals. Although morale is related to job satisfaction, it is not the same thing. There is no justification for using the two terms interchangeably. Job satisfaction, as we have seen, is the result of the various attitudes the individual holds toward his job, toward related factors, and toward life in general. Industrial morale is the composite expression of the attitudes of the various individuals employed by a company. It is generated by the group and may best be considered as a by-product of the group.

Industrial morale is definitely not an average of individual attitudes. For example, a company's morale may be low even though many employees enjoy considerable job satisfaction. Certain individuals who are dissatisfied with their jobs may lower the overall morale. Even one or two completely disgruntled workers, who are not recognized as such but rather are respected by their fellow employees, will tend to lower the morale of the group appreciably. Similarly, an erratic, unpopular, or ineffective foreman will lower group morale, even though most of the factors contributing to job satisfaction are present.

Conversely a few people may have a noticeable effect in raising industrial morale even when little is offered to most of the employees in terms of the specific factors of job satisfaction. World War II showed that two otherwise similar squadrons can be very dissimilar as far as morale is concerned. Morale in similar departments in a factory often varies in ways that cannot be understood by studying the job satisfaction factors. An individual, or a few members of a group, can raise the morale of the entire group if his attitudes and behaviors can be adopted by the others.

The fact that morale is a by-product of the group and can often be generated by small segments of the group is important. It explains many of the paradoxes that are connected with morale. For example, the discharge of an inefficient and troublesome worker may have no effect on the morale of the group if it has not considered him a part of it; the group will regard this as a single and separate event. However, if he was liked by the others and they feel that he was not really troublesome and inefficient, then the group's morale will go down. On the other hand, if his fellow employees dislike him and hope that he will "get his," the group morale could conceivably be raised by his discharge. Another paradox in regard to morale is the statement that workers strike when their morale is low. This is contradicted by union organizers, who insist that morale must be high before a strike call can be promulgated. Now morale cannot be both high and low at the same time in the same group of workers. Obviously, in interpreting such statements about the group's morale, the point of view must be considered. From management's point of view, the morale is low if workers side with the organizer; but from the union's point of view under these circumstances, the morale is high.

### Determiners of Morale

Morale can best be understood in terms of four determiners. The most outstanding determinant is a "feeling of togetherness" or group coöperation. The second is the need for a goal. Third, there must be observable progress toward the goal. Fourth, the individuals in the group must have specific meaningful tasks that are necessary to the achievement of the goal.

Employees in a normal work situation rarely function as totally isolated individuals. Whether management is aware of it or not, the workers are likely to form a group or a number of subgroups. The ideal situation, and one which makes for the highest morale, is one in which there is a single group that includes all employees, the representatives of the employer,

and the employer. The extent to which management attempts to achieve this is the extent to which morale is likely to be present. Unfortunately, the factor of group formation is too often overlooked in industry. The introduction of favorable environmental factors such as changes in illumination, music, or air conditioning may or may not work, i.e., increase production. In and of themselves such factors are unpredictable. The key to whether they will work lies in the group's reaction to the change. If the group believes that the change will benefit it, the reaction will be favorable. On the other hand, if the group is suspicious of the change, it will resist it. Changes instituted by management, with the most altruistic intentions, often boomerang because management has overlooked the importance of the "feeling of togetherness," or group coöperation. It cannot be assumed that increasing material efficiency necessarily increases people's capacity to work together. In fact, unless management takes specific steps to encourage the formation of a group that includes labor and management working together, the employees are likely to form their own group and deliberately exclude management. Management's best chance for inclusion is the adoption of a democratic group structure and the providing of an opportunity for the four determiners of morale to function.

It is impossible to deny the existence of a social structure in any company. To do so is to refuse to face reality. But management does this when it insists that people work solely for money. Men and women lead a social life on the job; they make friends and enemies; they exchange confidences, meet socially after hours, eat together, and do favors for one another. In short, consciously and unconsciously they form groups. These groups can be the basic core of morale formation if management will only recognize this and if it can funnel this energy into the proper channels of coöperation. Management's failure to recognize this leads to many of the mistake it makes. Technical changes result in social changes; and while the technical changes may be logical from management's point of view, they are often unsuccessful because the social changes which accompany them have been overlooked or miscalculated.

Promoting group coöperation is easier if the group has a goal to achieve. The goals in industry may be more obscure than such goals as winning a war or a football game but with proper guidance they can be made clear. Doing the best one can on the job many constitute a goal, provided the employee receives evidence that this goal is understood. Advancement, security, increased earnings, and individual and group

welfare can all be goals, provided management encourages them and the employee has evidence that they are real and attainable.

Some "scientific managers" have suggested that slogans are an excellent means of increasing morale, on the assumption that a good slogan may very well become the goal. This is best illustrated by the story about a big boss who attended one of these "scientific" sessions and was impressed by the suggestion. He set the slogan "Do it now" as the goal and had it posted in various conspicuous spots in the plant. From his point of view, this goal was anything but desirable, for the bookkeeper immedi-
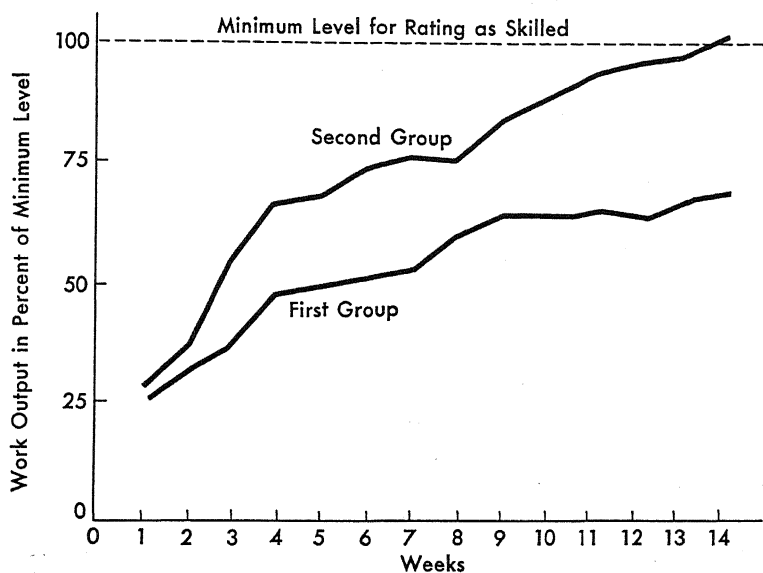
*Figure 6.1.* Effect of Observable Progress Toward Goal. (From G. Watson, ed., *Civilian Morale,* Boston, Houghton Mifflin Company, 1942.)

ately absconded with the company's funds, the salesman married the boss's daughter, and the office boy threw the inkwells into the electric fans.

In addition to having a goal, it must be possible for employees to make observable progress toward it. A good example is seen in Marrow's work in his own plant (*10*). One group of power machine operators were told the level of production they would have to reach within 14 weeks. Another group were told the final goal but were also given weekly goals; 66 percent in this group reached the goal. Figure 6.1 shows the effect

that a too distant goal which the worker judges to be unattainable has on performance.

The last of the four determiners of employee morale involves specific meaningful tasks for the individual in the group to perform, and a sense of participating in the group's work toward the goal. If the group's goal is 1000 units per day, each individual member must understand clearly how his specific job contributes to its attainment. If the output is merely to management's advantage and does not contribute in some definite way to the employee's advantage, the goal is likely to be regarded as management's and not the worker's. However, if the employees are consulted or properly informed about setting the goal and actually derive a fair share of the benefits that accrue, there is then a strong goal. Even a floor boy can see how he contributes by helping the assemblers, although he does no assembling. The first workman passes his completed share of the unit on to the second worker, and this continues, with every member of the group participating in a meaningful way in the achievement of the goal. This is morale.

Table 6.1. Distribution of Morale Scores

| Morale Score | Percentage of Group |
|---|---|
| 90–100 | 13.5 |
| 70– 89 | 41.3 |
| 50– 69 | 31.1 |
| 30– 49 | 11.6 |
| 10– 29 | 2.4 |
| 0– 9 | 0.1 |

Hull and Kolstad (7) report the results of a study in which the morale of 43,962 employees in 141 separate employee populations was measured. The value of such extensive work is that it enables morale in one company to be compared with that in other companies and the factors contributing to higher or lower morale to be isolated and interpreted. Since the specific scale is not given, no comment can be made as to whether morale, job satisfaction, or specific attitudes were measured. But, since both men are recognized authorities, it can be considered probable that something really basic to morale was measured. The distribution of morale scores among these employees is shown in Table 6.1. The average morale score on this scale is 69.7. Hull and Kolstad concluded that the results failed to show high relationship between morale score and type of

work done. They found no significant relationship between morale and general wage level. However, there was a definite relationship between tenure of employment and morale. The morale of employees who have worked less than one year and those who have worked more than five years is higher than that of the one-to-five-year group. Managers, foremen, and supervisors rank higher in morale than do rank-and-file employees, as Figure 6.2 indicates.
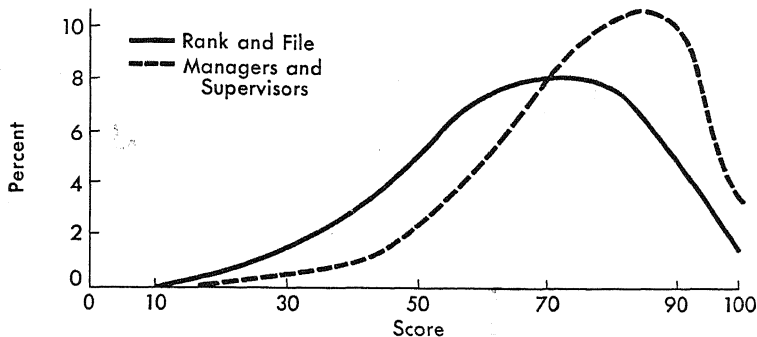
*Figure 6.2.* Distribution of Morale Scores of Rank-and-File Employees and Supervisors. (From G. Watson, ed., *Civilian Morale,* Boston, Houghton Mifflin Company, 1942.)

Hull and Kolstad say that the psychological satisfactions that come from day-by-day recognition of and respect for the employees' personality are just as important for morale as pay, hours of work, and working conditions. They also are convinced that the foreman plays a large part in determining employee morale.

### Measurement of Morale

The best single measure of morale is one that measures the group and subgroup formations. A technique has been devised for this purpose by Moreno (*11*); he has called it sociometry. Jenkins (*8*) has modified Moreno's technique and called his method the "nominating technique." He has used it with considerable success in studying morale in the Navy. Further reference to this work will be made in Chapter 8.

The technique is simple. Each person in the group is asked to name the person in the group whom he considers the best worker, or the one who would make the best supervisor, or the most fair-minded person. Each individual is represented on a diagram by a circle; an arrow is drawn from it to the circle representing the person he names. The leader

of the group is he who receives the greatest number of choices. If this individual is also the boss, then he is both the formal and the informal leader. However, if the formal leader does not receive many choices, it is immediately apparent that he is leader in name only and that the informal leader, if there is one, is the real force in the group. This person is known as the "star." Actually, there may be more than one star in a group. A person who is never chosen is called an isolate; he may be so unimportant that if he dropped out of the group its structure and morale would not change. Sometimes two workers choose each other. Such individuals are usually known as "mutual admiration societies" and may function as separates rather than in the group. A triangle occurs when X chooses Y who in turn chooses Z; this is the beginning of a subgroup and may be enlarged into a clique. Figures 6.3–6.5 are simple sociograms that illustrate some of the various types of group structure.
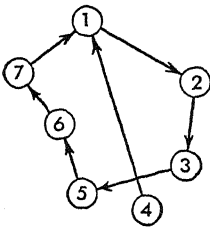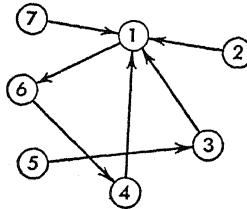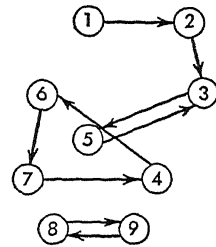
*Figure 6.3.* Sociogram of a Cohesive Group Without a Strong Leader.
*Figure 6.4.* Sociogram of a Group with a Strong Leader.
*Figure 6.5.* Sociogram of an Unstructured Group with Cliques, Isolates, and Mutual Admiration Societies.

In actual practice, sociograms may become very complicated. Figure 6.6, showing a sociogram made by Jenkins in his work with a Navy squadron, illustrates the complexities.

The study of sociograms is valuable. It can furnish leads as to clique formations and the extent to which they may act as disruptive influences in the organization. It can substantiate observations which formerly may have led merely to suspicions. It can pick a potential leader far in advance of any principle of seniority. A sociogram is much more than a popularity poll.

Sociometrically selected work teams can increase production. Van Zelst (*14*) obtained a 5 percent saving in total production costs by allow-
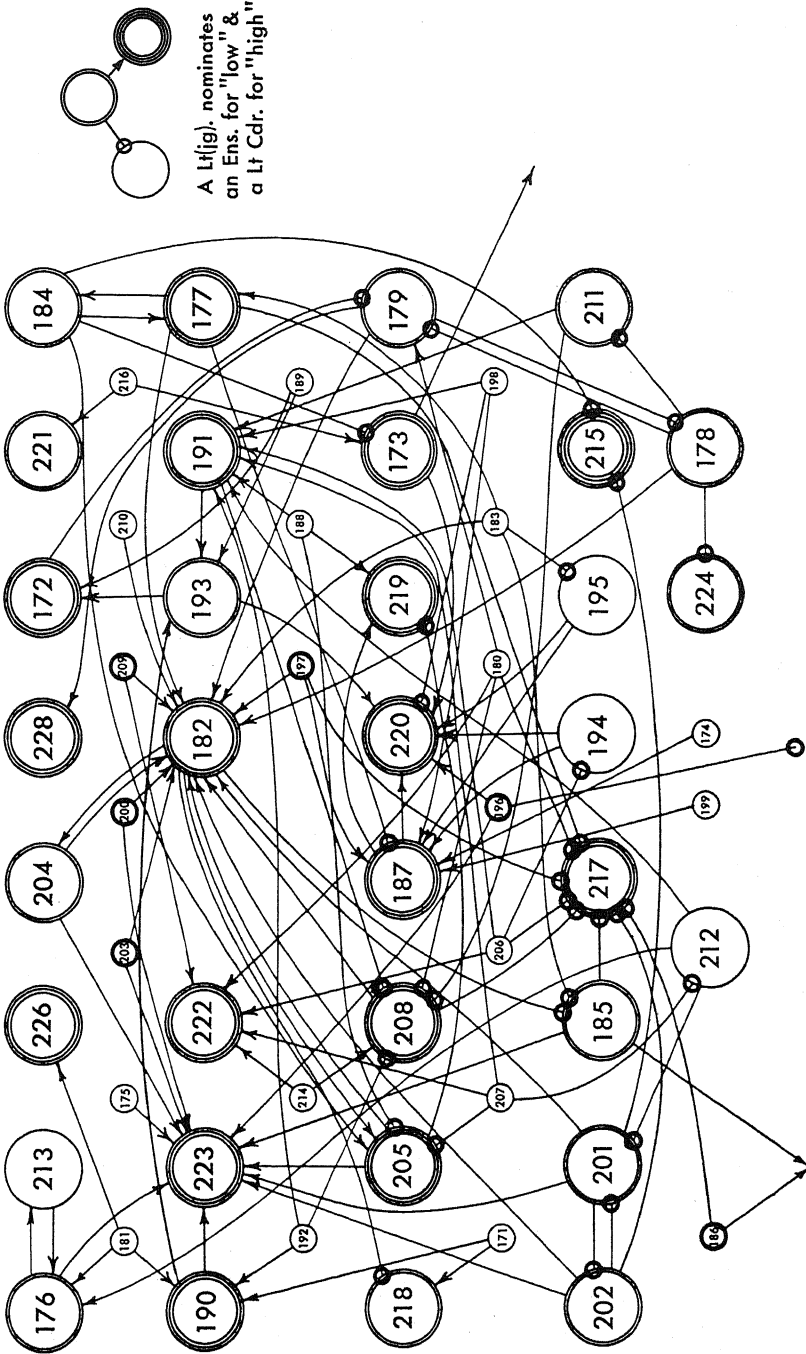
*Figure 6.6.* Sociogram of a Navy Squadron. (Courtesy of the Navy Department.)

ing carpenters and bricklayers to choose their "buddies" as partners in work. Work teams were assigned based upon stated preferences. Twenty-two workers were assigned their first choices as partners, 28 had their second choices, and 16 obtained their third choices. Eight of the 74 were isolates, i.e., not selected, but were of course assigned.
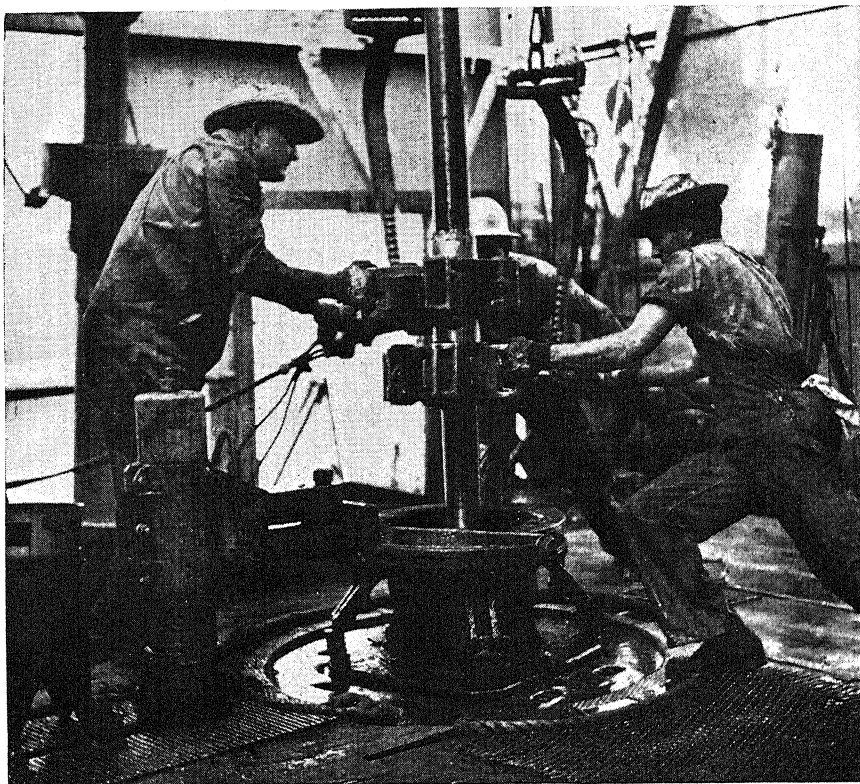
*Figure 6.7.* Men Often Work as a Team. (Courtesy of Standard Oil Co. [N.J.].)

Van Zelst reports the following subjective report of one of the workers: "Seems as though everything flows a lot smoother. It makes you feel a lot more comfortable working. I don't waste any time bickering about who's going to do what and how. We just seem to go ahead and do it. The work's a lot more interesting, too, when you've got your buddy working with you. You certainly like it a lot better anyway."

This principle of having workers assign themselves to pairs on work locations rather than have management superimpose rigid rules is not idle folly. It is of the essence in building morale. More of it should be

applied to industry, since workers must often work in teams (see Fig. 6.7).

But in measuring the other three determinants of morale—goal, progress toward goal, and meaningful participation—the sociogram may be of little value. In order to obtain objective data in these fields, the attitude scale, the questionnaire, or the interview has to be used. The material already presented has indicated the approach and method that should be chosen.

The suggestion that the sociogram, together with questionnaires, attitude scales, and interviews, affords the best measure of morale has been made without overlooking the many indexes that are usually considered measurements of this factor. Among these indexes are strikes, labor turnover, absenteeism, grievances, suggestions, and production figures.

Giese and Ruter (*6*) have attempted to predict the morale of departments in a company from objective data. They obtained a multiple correlation of +.71 between the six objective factors they studied and morale as measured by a questionnaire. Because of the high correlations they propose an objective morale index which could be obtained by measuring the following factors: productive efficiency, error efficiency not affecting customers, error efficiency affecting customers, turnover, lateness, and absenteeism. They find that when morale is low, department absenteeism and lateness tend to be high. They found only a slight relationship between morale and productive efficiency. The notion that morale of a department may be reflected through certain types of group performance in combination is an interesting one and is probably more meaningful than either attempting to correlate morale with a single criterion, such as production, or confusing morale (a group phenomenon) with job satisfaction (an individual phenomenon).

Bernberg (*1*) reports a study based on 890 hourly paid employees in a large aircraft manufacturing plant. On the basis of a statistical analysis of the results he found that no significant relationship exists between the tests of morale and the specific indicators for the prediction of individuals but that tests of morale can be predicted for departments and factories. Bernberg's results underscore the fact that morale is a group phenomenon rather than an individual phenomenon.

He had five indicators, namely, absences, tardiness, short-time absences, trips to a medical unit, and merit rating. In addition, he combined these into a total indicator. He used an indirect method of attitude measurement as a measure of morale and also a direct attitude measure. His ob-

jective was to determine which of two morale theories is more predictive of performance indicators. One theory considers morale a group phenomenon and the other considers it as the degree of acceptance of formal organization. Actually the difference between these two theories is about on the level of hairsplitting. Both are intended to measure a group phenomenon. Both avoid considering individual attitude and job satisfaction as equivalent to morale. His results indicate that these two measures correlate to the extent of +.77. Clearly, both hypotheses predict group differences (i.e., departmental differences) but not individual differences on performance variables. This study obtained its data from 890 of the 1009 hourly workers in five departments of three factories in an aircraft company.

A word of caution is necessary with regard to the idea that objective indicators can be regarded as predictors of morale. It may be best to regard such concepts as external indicators flashing red lights demanding a stop-and-look reaction. While these indicators may indicate low morale, they may otherwise indicate ineffective leadership or inadequacies of training or selection or work standards.

The difficulty with these indicators is that they may be due only in part to morale; there is no certainty as to how much other factors enter the picture. For example, a strike may indicate not low morale but a reflection of business conditions. Similarly, workers with low morale may not dare to strike because they feel much too defeated and beaten; in this instance the absence of a strike is due to low rather than high morale. Nor can absenteeism and labor turnover always be looked upon as indications of low morale because conditions in the labor market, the weather, and other factors may induce such behavior on the part of the worker.

Workers whose morale is high may want to make suggestions but refrain from doing so because other employees might resent their ideas. Roethlisberger (*13*) cites one company that turned its employee suggestions over to a judgment committee and made suitable awards. Management posted the notice of awards on its bulletin boards in order to stimulate further suggestions and give the winners recognition. This well-meaning program created increasing dissatisfaction. Foremen often discriminated against workers who won when the suggestion related to work within the foremen's area of responsibility, for they interpreted such suggestions as criticisms of their work. Likewise, workers whose jobs were simplified as a result of the suggestions, and who consequently received lower pay rates, put pressure on the person responsible for the

suggestion. In addition to these troubles, when the winner owed money, claimants appeared and asked the company to settle on the basis of the employee's "windfall." Management finally had to modify its procedure and publish awards by code number, thereby eliminating the recognition factor which had been part of its original intention. To put it briefly, this suggestion system did not develop or promote coöperation, and consequently it served to lower rather than raise morale.

### Methods of Increasing Industrial Morale

The measurement of industrial morale serves as a barometer to management. If the findings indicate low morale, this must be regarded as a challenge, and steps must then be taken to improve it. Four methods have been used to increase industrial morale. In order of frequency of use, but not necessarily of advisability, they are:

1. Expert approach.
2. Industrial spy.
3. Industrial counselor.
4. Employee problem approach.

The *expert approach*, the most frequently used technique, has resulted in mixed success and failure. The basic feature of this approach is the use of an "expert" in making a spot survey. He tours the plant, talks to key people, and writes a report in which he gives advice. Sometimes he suggests any or all of the following items: posters, slogans, speeches, parties, or welfare associations; these are likely to give morale a slight spurt for a short period. When things lapse back to normal, the company calls in another "expert." Since it is now somewhat more critical, it shows him the previous report and intimates that things did not go as predicted. Of course the second expert knows this, for otherwise why would he have been called in? This being the case, he has to produce some new devices for boosting morale. He suggests bowling contests or better cafeteria meals, an effective house organ or a suggestion system. Again there is a slight lift in morale for a short time and then things take a turn for the worse.

The point is that any or all of the five suggestions of the first expert might work under certain conditions, but the conditions are never suggested or complied with. This is true also of the four suggestions of the second expert. These nine suggestions do not by any means exhaust the list; there are many, many more. Some companies and their executives

seem to thrive on them. When any of the suggestions promote group coöperation, establish goals, allow for observable progress toward goals, and present an opportunity for employees to participate meaningfully and actively in their achievement, they can increase morale. Checking the above list of suggestions makes clear that few in themselves encourage coöperation or meet the requirements of the other determiners of morale. The writer is reminded of a dance given for employees of a large company which was supposedly promoted by their "benevolent association." It was a full-dress affair and the president of the company was present to show that he was just one of the boys, and to award prizes. Early in the evening two of the employees put on an unscheduled dancing exhibition. In uninhibited fashion, they twisted, turned, and contorted, to the delight of the huge circle which formed around them. The president's reaction to what he considered a shocking and revolting performance was to order it stopped immediately and to warn the couple about conduct unbecoming ladies and gentlemen of the X Company. Needless to say, he effectively dampened everyone's spirits and unknowingly made himself very unpopular. Most of the employees felt that if he "couldn't take it" he should have stayed at home; besides, he wasn't their boss on Saturday night. The morale was lowered far out of proportion to the slight increase that such a party could have created.

The *industrial spy* technique, although dangerous, is frequently used as a means of increasing morale. An expert whose true identity is unknown to the employees, and usually to many of the executives, is given a job in a plant under the guise of an ordinary worker. It is his task to gain acceptance as a fellow employee and thus acquire intimate knowledge of the group and its complaints. He puts this information into a report. Sometimes such reports do not refer to specific employees but deal mainly with uncovering environmental conditions and technical difficulties which, in his opinion, lower morale.

The ethics involved in this type of report are not as distasteful as in the case of reports which take advantage of the confidences gained by the "spy" to locate the individuals who, according to management's definition, are "agitators" or "troublemakers." Sometimes union organizers and members are put in this category. Eventually, the "spy" disappears as suddenly as he appeared and the workers wonder about what happened to that "nice guy." His recommendations are acted upon later in the form of dismissals for "just cause."

Some readers may be sickened by such tactics, but to those who believe

that all is fair in love and war this technique is very appealing. It should be emphasized that not all industrial "spies" are dastardly. Some do a very ethical job and their reports show that they are really concerned with employee welfare and increased morale. Some even go so far as to place the blame on ineffective management when they find that this is where the trouble lies.

The *industrial counselor* has none of the unpleasant connotations that are attached to the industrial spy. As we saw earlier, the Hawthorne Studies culminated in the suggestion that the industrial counselor is useful in increasing morale by improving relations and acting as a communication channel between employee and employer. The employees are told that the industrial counselor is a representative of the personnel department, and they are paid their average earnings during the time they spend talking with him. Experiences at Western Electric indicate that employees are willing to bring their problems to a counselor and will talk openly and freely to him.

Besides being useful in aiding supervisor-employee and employee-management relations, the industrial counseling program has also been valuable in improving the personal adjustment of the individual employee. A case cited in *Fatigue of Workers* (*12*) is a good illustration of this point.

One day an assistant foreman called the attention of the counselors to a problem which had been worrying him for some time. The problem was a man of forty-eight who had had about twenty years of service with the company. His history was as follows. In his early years of service he was apparently an efficient worker. He was made a group chief in 1923 and remained in that position until 1931. But at that time he was considered one of the least efficient supervisors in the group, and thereafter his fall was gradual but steady. He was demoted from job to job, and in each successive job he failed to measure up to the proper standards of work. When the foreman consulted the counselors this employee was at work on a job of the lowest grade, being paid considerably more than this grade warranted, and not earning his money. These were the essentials of the problem as they appeared to the heads of the department when the foreman called in the counseling organization. "They felt that they had given the employee every possible opportunity to make good and that he had failed. They also were disturbed because he appeared to be drinking heavily, and, more recently, because he was not at all cooperative."

The department proposed to shift the employee to a grade 1 (lowest grade) job in another organization and cut his hourly rate to the minimum of the grade. They proposed to explain to him that this would be his last chance and that if he failed he would be dismissed. In the meantime a counselor had been at work. He had had a preliminary interview with the employee which had indicated that the employee's failure was the result of a personal maladjust-

ment. He asked that the transfer be delayed a few months or until a detailed study of the case could be made.

The study consisted of interviews with the employee, a thorough physical examination, several intelligence and vocational tests, and a careful investigation of the employee's supervisors, his associates on the job, and the mechanics of all the jobs on which he had failed. Here the report may be cited again: "The interview showed an employee who was raised in one of the west-side slum districts. The family consisted of two older sisters, an older brother, the employee, and a younger brother. The mother died when the employee was very young, and he does not remember her. The older sister managed the house. The father was a strict disciplinarian. The children were punished frequently and they were not allowed ordinary liberties. This was so pronounced that the older brother left home as soon as he finished school. The father was employed as a laborer until his death, which was shortly after the employee graduated from grammar school. The employee worked during vacation time while he was in seventh and eighth grades, and he found a steady job immediately after leaving school. He worked for several concerns until he enlisted in the army during the World War, and when he returned at the age of twenty-nine he was employed at Hawthorne.

"During this time he formed a close relationship with his older sister who never married. She kept house for him until a few years ago when he moved to a hotel across from the Plant. This move was made during the period when he was having difficulty on the job, but he continued to contribute toward her support and still has a very loyal attitude toward her."

Such was the past history of the employee, as it was revealed in his interviews with the personnel counselor. His attitudes in the immediate situation were described in the report as follows:

"1. Fear of the supervisors (foremen especially). Belief that they had it in for him. Feeling that they were watching him all the time. He could feel the foreman's eyes on him when the foreman was at the other end of the room.

"2. Belief that his nervousness was a 'shell shock' hangover from the war, in spite of the fact that he was in good health for years after the war and was not nervous until recently.

"3. Fear of sickness. He had been under the care of several doctors who tried to convince him that he was all right. He took 'nerve medicine' regularly four times a day. His closet shelf was full of pill boxes and cold cures. He wore a jacket on days when it was so hot that his shirt was wet with sweat. He talked of his health, his sister's health, boyhood friends who had terrible diseases. He went into a tantrum if the hotel room was cold or the department was drafty.

"4. His only associate outside the Plant was a tubercular war veteran with a shady character, and he did not see him often. Most of his time was spent in his room with a cheap magazine. He also did not talk to anyone in the department unless they asked him a question."

The method used in dealing with the employee was typical of personnel counseling. He was interviewed daily until he had expressed much of the emo-

tional disturbance in his thinking, and in expressing it, freed himself from it. Thereafter, the interviews were limited to two a week, and the counselor concentrated on helping him to think sensibly about his work, his supervisor, and his associates outside the Plant. As soon as an improvement was recognizable, the counselor went to the proper group and section chiefs and asked them to talk about the employee. They were asked to express their criticism in as much detail as possible. The counselor did not differ with any of the opinions expressed except to make the general comment that he thought the employee's attitude had improved. This process was carried so far that the counseling organization did not object when the division chief called with the information that the employee's hourly rate would have to be cut. This event occurred six months after the case had been opened. The organization asked only that the explanation be given to the employee in terms which would carry conviction to him. Later the organization attempted to assist the section chief in preparing a statement for the employee, and in this conversation the section chief found his case very weak and decided to do nothing.

The report continues as follows: "This approach to the problem has resulted in the following changes in the situation:

"1. The supervisors are taking a genuine interest in the employee and they are helping him with encouragement instead of criticism. Both the group and the section chiefs are now taking personal credit for the improvement and they claim to have made arrangements to assign him to higher graded work in the near future.

"2. The employee has increased his efficiency from between 60% and 70% to about 100%. There appears to be little lost motion in his activities on the job, and he appears to be getting a real feeling of satisfaction in doing his job better than the rest.

"He is also very friendly with all of the employees, both men and women, who work near him, and he spends his rest periods talking with a group of employees who work in the other end of the room.

"He has developed several close friends in the hotel and he occasionally joins a group playing pinochle. He has been keeping steady company with a girl whom he expects to marry. They plan to move to a furnished apartment. Due to her influence he spends several evenings a week at the movies and dances, or with their friends.

"About a month ago he quit spending his money on doctors. He takes no medicine and says he feels better than he ever did. He has discarded the jacket that he was continually wearing and observes that he is no longer troubled with colds. This is interesting because he said he always had a cold about this time of the year. The only remnant of the old attitude toward sickness is his excuse for marrying. He says a man of his age needs someone to take care of him.

"From a social point of view, this employee is now in working equilibrium with his environment. His attention is on the job. The supervisors appreciate his efforts; the new employees respect his knowledge of the job, and the older employees are friends instead of sympathizers. The concentration of our efforts on a personal adjustment without taking into account the other areas—supervisor,

associates, and the job itself—would have probably resulted in failure. The total adjustment depended upon work with the employee's attitude, the supervisor's attitude, his associates' attitudes, and with assistance in studying the job and developing an appreciation of coordination of activities."[1]

The industrial counselor can be helpful in increasing morale because he is in a position to promote group coöperation and to help the person see the goal, his advancement toward it, and the meaning of his work in relation to achieving it. The only trouble with this method is that it does not go far enough; it may be merely a substitute for the employee's self-expression rather than the expression itself.

The fourth and most promising approach in increasing morale is the *employee problem* technique. It has not been used as widely as the other three but has many advantages over them. However, it requires skillful handling and for that reason many people are unable to use it. Since it attempts to put democracy to work, this method deserves serious consideration.

In the problem approach, the foreman, the boss, or best of all a trained psychologist (who does not play the role of expert) presents a currently pressing problem to the employees, and then, with a minimum of interference but some guidance, allows them to work it out for themselves. Obviously, group coöperation is a natural by-product of this method and this in itself constitutes an important factor in increasing morale. In working out the problem, the employees establish a goal: the solution. They see the progress they are making and they actively and meaningfully participate in the effort to solve the problem. Hence all the determiners of morale are present, and increased morale is automatically achieved along with the solution of the specific problem.

The types of problems that can be used are almost limitless as long as they concern the specific group. Work hours, production increases, vacation schedules, and overtime work, as well as the many irritations which arise from day to day, are all suitable for this technique.

In the employee problem technique, a group meeting is called and the problem is briefly presented by the discussion leader, who may be an outsider, an employee, or the employer. Whoever he is, it is important that he be trained in the art of conducting a democratic meeting. He must encourage free discussion and he must be in a position to assure the group that the management will respect its final recommendation. In the

[1] From National Research Council, *The Fatigue of Workers*. Copyright, 1941, Reinhold Publishing Corporation.

first meeting the group is usually silent for a short time, but someone eventually speaks up and then there is bedlam. Within a few moments, there will be shouts for order and one person will manage to be heard above the others and thus gain the group's attention. One view is discussed after another, and finally someone suggests that a vote be taken. It is important that no pressure be put on the group to reach a decision and that the leader handle the discussion in such a way that no one will get the impression that he is steering the group toward a certain decision. It is not necessary for these group meetings to be held regularly. One or two discussions on a specific problem are usually sufficient. When the group has reached its decision, it will stick to it and, what is more, feel proud of it and of its members.

Three brief examples of this technique will be given. Students in the writer's classes sometimes purchase a number of books which they leave in the library for their exclusive use. Soon some student complains that he cannot get his book because someone has removed it from the library. At this point, the instructor calls this to the attention of the class and asks it what, if anything, should be done. There is the customary short silence; then many students speak at once and no one can be heard. Within a short while they recognize this and either calm down or ask the instructor to act as chairman. He calls upon one student to present his view. If his ideas are unpopular, others make suggestions. The interesting point is that semester after semester each group finally draws up a code of conduct. The usual decision is that all books must remain in the library except over week ends, when all but two of them may be taken out from Friday afternoon until Monday morning. Do the students ever break these rules? Of course not. To do so would mean breaking rules they themselves formulated, and relegating themselves to the position of social outcasts. Incidentally, the library has its own rules regarding fines on books kept out after the due date, and the students willingly pay the fines.

A high-school principal who took a seminar which the writer conducted and in which the democratic principles governing group behavior were used was very sure that this method would not work. After about six weeks she came to a session and announced, "I'm tired, but I found out that democracy works." Urged to explain, she went on:

I've just conducted a faculty meeting democratically. It was exhausting for me—but it worked. You see, we've always had trouble about advisers for after-school clubs. The teachers always say they're too busy and they refuse to take on the job. This year they insisted there were too many clubs, and they wanted

me as principal to decide which clubs should be eliminated. I turned it back to them, and asked them to discuss the values of each club and then decide which ones should be discontinued. As they talked, they decided every single club was important. They voted to keep every one, and each club got an adviser. I learned something; being democratic is not only a good theory—it brings results (3).

Although these two illustrations have been drawn from groups with above-average intelligence, the method works equally well with people of average intelligence. The success of this method is not a function of the group's intelligence. For example, the employees of a factory that manufactured curtains complained to the boss that the rate set on a particular item was too low, and they threatened to quit if it were not raised. Actually, the rate was fair and was equal to the previous average earnings, and the boss believed that he could not increase it. Using the employee problem method, he called the group together and presented these facts. He also told them that he was concerned about the problem and wanted to see it worked out fairly for everyone. First came the suggestion to grant the increase, whereupon he told them that in his opinion the time study had set the rate fairly. Then an employee suggested that they time the operation. The boss had nothing to lose by doing this, because the rate had been set honestly in the first place. The group then arranged to have some employees work on a few bundles of curtains and to have other employees do the timing. The necessary simple calculations were made and the facts presented to the group. They decided that even though they did not like the "number" they would do the job since their earnings would not be reduced. The employees felt better because they knew they were not being cheated, and the boss not only prevented employee turnover and a money loss but gained increased respect. He is very different from the authoritarian, "do it—or else" type of employer.

An extension of the employee problem approach naturally leads into the potent and meaningful concept of group dynamics in industry since a realistic study of human relations in industry demands study not only of the individual—either employer or employee—but of the group or groups that individuals form. Such awareness encourages the view that the solution to many industrial problems involving employees, supervisors, and employers lies in a better understanding of the group dynamics involved. Accordingly, the hypothesis is advanced that a solution to industrial conflict lies in the unraveling of the psychological dynamisms involved in the interrelationships of individuals on the job.

The organization of business, both big and small, demands that people work together in teams. In some few instances, the team approach is recognized and even labeled. More often men with different personalities represent different aspects of the same business and regard each other as obstacles. They do not perceive the other man's needs except from their own frame of reference. Accordingly, sales, engineering, research, accounting, and management regard each other as threats or interferers, and too often are not even consciously aware of their hostile reactions to others.

The group dynamics approach attempts to solve this problem by creating group atmosphere and thereby allows the various members to understand better one another's problems and needs. It results in changes in behavior and, when successful, creates the team approach. For the present, there is no one best way to achieve this, and many diversified approaches find equally enthusiastic support in varied quarters. Certain awarenesses come from outside the field of psychology. From business, such men as James F. Lincoln of Lincoln Electric Company and Charles P. McCormick of McCormick and Company are examples of proponents of this view. Both of these men are enthusiastic about their plans, point with pride to their results in dollars, and emphasize their practical aspects. They might even deny a concern for the features of the plans that are of great interest to the psychologist. They nevertheless are present.

The psychologist has approached this problem more scientifically. He has been more concerned with theory, variables, and controls. He has used his professional language and has even created resistance as a result.

The Likert-Katz approach at the Center for Human Dynamics at Michigan and its predecessor at Massachusetts Institute of Technology has done important work in this field. Richardson, Bellows, Henry and Company, a consulting organization, is aware of the potency of the concept of group dynamics and three examples of their work are described (2).

In an industrial situation, as in any other, people form groups. As soon as one studies such groups it is obvious that:

1. The structures of these groups differ.
2. The groups are rarely distinct; rather they overlap.
3. Certain individuals (not necessarily known to management) determine the group behavior.
4. The behavior of certain individuals is determined by group behavior.

5. Individuals in a group contribute to group structure and behavior in different degrees.
6. The group generates a climate that transcends individual feeling.

Further, it must be recognized that predictions of group attitudes and behavior are possible. As a result of encouraging group formations or working with those already formed, it has been found possible to:

1. Change the purpose of groups.
2. Change the structure of groups.
3. Change the personality of individuals in a group.
4. Promote an understanding of the motives of others in the group.
5. Improve morale.
6. Solve problems by reducing conflict.

One technique that serves the purpose of harnessing group dynamics may be called the *vertical round table.*[2] In a particular company about thirty sessions were held at a round table with twelve representatives of different levels of management. A round table was deliberately used to avoid seating according to status, and by having different levels participate, a vertical view of management was obtained. Meetings were held as luncheon sessions, away from the plant, and no one was expected to report back to the plant that day. It was intended to have these sessions for frank talk and a good time: a bar and meals helped achieve the latter. Three topics were proposed for discussion: (1) human nature and what little we know about it; (2) the present American industrial scene and its problems; (3) the problems at ——— Company, especially bridging the gap between management and the workers.

The order of presentation of the topics was important, and developments have shown that, by not discussing company problems immediately, the difficulty of status consciousness and its interferences with frank expression was, to a large extent, reduced.

At the start, the six upper-level men grouped themselves and talked much; the six lower-level men (none of the twelve were on the same level) talked little. As the series progressed the groupings disappeared, talk was contributed more evenly, and the inhibitions of status disappeared.

Analysis of discussion content revealed the following changes:

[2] The term "vertical" refers to the status of the executives participating in the round table.

| Problems | Early | Middle | Late |
|---|---|---|---|
| 1. Human nature | 60% | 30% | 10% |
| 2. Industrial problems | 30% | 50% | 20% |
| 3. Company problems | 10% | 20% | 70% |

Another shift was from fun (storytelling) to conflict and catharsis—to discussion and listening—to problem solving. We could not be psychologists if we did not use attitude scale measurements, and so we did. Shifts took place and the evidence is that the liberals became slightly more conservative and the conservatives became a great deal more liberal.

It is now more than five years since the vertical round table was introduced in this company. At present, many vertical round tables are in existence in various divisions of the company. Specific changes and improvements have been effected, and in addition, as a result of the entire plan, a uniform statement of policy concerning employee relations has been evolved.

In another company, a program of testing and counseling executives evolved the *inverted pyramid technique,* thereby continuing to distort geometry. Working with individuals brought to light considerable rivalry, with many striving to outdo each other to gain top management favor. The result was wasteful competition, personal rivalries, and little awareness of the need for coöperation. Each claimed he was willing to coöperate, but it was always the others who would not. The inverted pyramid technique resulted in a group conference, but only after interviews had been held with individuals, then pairs, then quartets, etc.

The following is a brief illustration of the way this method operates. An interview with Allen reveals that general conditions in the supervisory group are getting very bad; that backbiting is becoming worse, and a change is needed. He expressed loyalty to the company but concern about Baker, who is very erratic. He believes that Cox is close to Baker, and for that reason he feels he cannot talk to him because he carries tales. However, he likes and respects Cox. It turns out that Cox believes the company is running very smoothly. Each is willing to talk things over, however, and so a paired meeting is arranged. At this session Cox expresses admiration for Allen's ability to get things done but is concerned about the rough treatment Allen gives his supervisors. After citing a specific case, Allen responds by indicating he is afraid that if he does not do it that way he will be blamed for any shortcomings by Baker. He further states his respect for Cox but fears that he tells everything to Baker. Getting down to specifics, Allen only reports suspicion, and in turn,

Cox illustrates how he really stands up to Baker. They then become involved in a discussion of the confusion caused by lack of clear channels and the crossing of those that exist. They agree that Doe, the big boss, should be informed and other executives called in for such meetings, that is if they so desire, and so it goes, with Allen meeting Baker, etc.

This series of meetings of the consultant with individuals, pairs, and groups does seem to be more than just talk. Better understandings have been worked through, and strong evidence of constructive group performance is emerging.

To further belabor our perverse geometry, we may call the third example the *circle with a point*. It occurs in a much smaller company than those previously described. The employer agreed to set up a human relations program which deliberately attempted to provide opportunities for people to express, be aware of, and understand feelings and attitudes that interfere with their effective functioning. Its main purpose was to improve interpersonal relations and improve the "we" spirit of the company. All key personnel were invited to the sessions. Actually, the conferences consisted of twelve individuals, plus the employer, and the group leader who was the consulting psychologist. The discussions were entirely free. There was never an agenda. Any topic that anyone cared to present was discussed. Actually, discussions centered around plant problems, about problems which group members had in their work situation, about interpersonal relations in the plant, and some personal problems.

The group leader actively led the group to analyze their participation in terms of the attitudes and feelings expressed. He never attempted to constrain members, even in moments of intense heat. His role was that of supporting some person when he believed it necessary, of drawing out members who were rather reluctant to participate, and of reflecting feelings in order to continue discussion leading to analysis and understanding.

As a result of weekly sessions for sixteen months, many things happened to the individuals as well as the group. Tex, a highly vocal, excitable person, a strong defender of the "rank and file," became a person who was now able to speak *for himself* as well as the "rank and file." He became more relaxed and secure and a team member. Cal, a suspicious and hostile person with a large "chip on his shoulder," changed to one who was cooperative and full of suggestions. He was willing to be critical of management and willingly volunteered to take on unusually heavy assignments. Monte originally was deferential to authority figures but later was able to challenge them if he felt his stand was justified. Phil, a timid and almost

nonparticipating member in the early sessions, became rather active and vocal in the later meetings. Needless to report, such personality changes did not occur in all the participants.

Fear and hostility toward the "Boss" tended to diminish during the course of the sessions as the participants had the chance to express hostile feelings without punishment, to see that the "Boss" was not the "sacred cow" and that he too had problems, and further, that he did not have magical solutions. During the sessions open expressions revealing anxiety, guilt, rejection, and insecurity, among others, came to the surface, and as these feelings were to some degree relieved, interpersonal relations improved. In turn, these led to the solution of operating and personnel problems, as well as the formulation of acceptable company policies.

Let us glance at the four methods of increasing morale in operation. The adjustment of windows is not only a time-consuming affair in almost any office or factory but one that leads to almost continual friction and lowered morale because it breaks the employees up into at least two groups—the "window open" or "we need air" group and the "window closed" or "we'll get sick" group. If the supervisor refuses to settle the question arbitrarily, there is likely to be a continuous procession to and from the windows. This is a small but nonetheless serious problem which affects morale and which must be handled carefully. Let us see how it can be solved by each of the four methods of increasing morale.

In the first method an expert is called in. He makes a study of the plant and comes to the conclusion that fans or air conditioning, or both, will solve the problem. The boss may reject this recommendation because of the outlay of capital required, or he may install an air-conditioning system at considerable expense only to find that some employees still want the windows opened because they need fresh air. The second method employs a "spy." Unknown to the employees, he observes what goes on and he makes frequent trips to the lavatory so that he will have a full set of notes. He finally spots the person who is causing all the trouble and those who are on his side. The "spy" may suggest that someone be fired or he may present an "ideal" seating arrangement for the group. But even if the ringleader is moved away from the window, there is always someone else who will take the lead in the fight, so the problem remains unsettled. Furthermore, the "ideal" seating arrangement does not work out because it is not likely to take status and sociometric principles into consideration. With the third method, an industrial counselor interviews a number of employees. He finds that one employee was scared by an open window

when he was two years old, whereupon he prescribes therapy that enables that individual to be a happier and better-adjusted person.

The fourth method, the employee problem approach, affords the best means of solving the problem. The boss or supervisor calls the group together and says, "We have quite a problem on our hands with the continual opening and closing of windows. Now let's not act like children; let's try to work it out." There is some laughter and then the employees start making suggestions, such as: "Let's have a schedule and keep the window open for 15 minutes every two hours." "Let those who don't mind open windows sit near them." When one of the group says, "We need air conditioning," the boss tells them that he has already investigated this possibility and that it will cost more than the budget allows. The group may then make other suggestions or decide to try one of the first two. If the discussion is not hurried and no pressure is put on them, the employees are likely to come to an amicable decision, such as trying the first suggestion for a month and then calling another meeting if there are still objections. The point is that the group makes the decision of its own free will and its members will be reluctant to break the rules because they may be considered poor sports. Although some of them may change their seats, there will be a marked decline in raising and lowering the windows.

Another petty problem in morale that often arises, especially among women in offices, is the "body-odor" problem. Someone accuses one girl of having "B.O.," and whether she has it or not, the other girls will refuse to work with her and insist that she be fired. Obviously a group discussion of this problem as it applies to one girl is inadvisable and should never be used. Here is a tender but tense situation, which is best handled by the industrial counselor. If the accusation is unfounded—as it often is—he tells the girl about the unfair attack and tries to help her become accepted by the group. He may even have to speak to the leader of the persecuting group about the unfairness and the prejudice involved. On the other hand, the girl may have a distinct body odor. If this is a medical problem (the intense and constant cases sometimes are), he should refer her to a physician, who will treat the condition after determining its causes. Other cases of B.O. involve the problem of body hygiene, and once a person is aware of her susceptibility she is usually willing to take the necessary precautions. The reason for mentioning this type of problem is to emphasize the fact that in handling individual problems of a personal nature the group technique should not be used, for it can result, psychologically, in more harm than good to the individual. The

group approach to a problem related to the group not only solves the problem but provides a promising means of increasing or bolstering morale.

### Summary

Morale is a by-product of a group and may be generated by small segments of the group. It has four determiners: group coöperation, need for a goal, observable progress toward the goal, and specific tasks of a meaningful and participating nature which can move the group toward the goal.

Morale can be measured by means of sociograms, which enable us to understand the group structure. Sociometrically selected work teams do increase production. The highest morale is found in a well-integrated group which has a "star" who is both the formal and the informal leader. The other aspects of morale can be ascertained through questionnaires, scales, and interviews that determine the existence and practicality of the goal and the group's progress toward and participation in the goal. Certain objective indicators when combined are found to predict department or group differences in morale. These indicators can be useful if their limitations are recognized.

Methods used to increase morale are the "expert," the "spy," the industrial counselor, and the "group problem" approach. The group problem approach is most likely to succeed.

An extension of the group problem technique leads directly into the potent concept of group dynamics in industry. Three variations on this theme are the vertical round table, the inverted pyramid, and the circle with a point.

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# CHAPTER 7

# Unemployment

**UNEMPLOYMENT** has not been a very intense problem (except for those who have been unemployed) within the nation since the depression of the thirties and so it may appear odd that a chapter on unemployment should be included in a book on industrial psychology today. However, unemployment is an industrial phenomenon with psychological aspects. Actually we must recognize that unemployment exists during periods of normal business conditions as well as during recessions or depressions. Some two million people are involved in so-called normal periods, and many times this number in depressions. There are many reasons for unemployment, and it would be presumptuous to assume that a system of industrial psychology could counteract the forces contributing to it. Industrial psychology cannot be considered a cure-all; hence it will be well for the industrial psychologist to examine the effects of unemployment so that he will be able to cope with it when it occurs.

An unemployed person is one who wants to be gainfully employed but is idle because of job shortages. Most of the unemployed meet this definition, but a few people are unemployed because they do not really want to work.

Unemployment has a serious impact on both the individual and society as a whole. An unemployed breadwinner not only is affected himself but also finds that his unemployment affects his whole family, including, of course, his children. During unemployment serious changes take place in the individual. These include changes in personality structure, attitudes, and various behavior practices. The primary reason for including material on the unemployed in this book is to familiarize people, especially college students, with these changes and with the behavior patterns characteristic of unemployment. The discussion of the various effects of unem-

ployment may enable the reader more readily to understand the abnormal behavior that sometimes is manifested by unemployed people.

The first five years of the 1950's have indicated some unemployment in local areas, but nothing resembling nation-wide difficulties has appeared on the horizon. Figure 7.1 shows men being hired for the day via the "shapeup" technique; for some unemployment always looms. The further one is removed from the "apple selling" days of the thirties, the more difficult it is to realize the horrible impact that such a situation implies.

If a business recession comparable to that of the 1930's occurs again, young people now in their teens or early twenties may suffer considerably. Comparing the 1940's with the 1930's is like comparing day and night because the major characteristic of the forties was a labor shortage whereas in the preceding decade it was a job shortage. Salary levels, price structures, money spent for amusements, and the extent of indulgence in luxuries are vastly different. If, in the years immediately ahead, there is to be a regression to the darker days of the thirties, the young people who are now at the age of their maximum energy and aspiration may be in for a rude awakening. Their fathers and mothers may have been "depression babies" and will have experienced the narrowing of needs brought about by the depression. Their caution, insecurity, and unwillingness to gamble on a change of job can be understood in the light of their memory of the preceding decade. The younger groups of today have not had these experiences; if they encounter them without warning, it may be that their maladjustments will be even greater.

This chapter is meant not to strike a note of pessimism but rather to review, in a matter-of-fact way, some of the research resulting from the last depression, in so far as the psychological effects of unemployment are concerned. Before discussing this material, the story of a reliefer will be presented (*6*). In part, it answers the question as to how a young veteran of World War II felt in 1949. It is not different from the way people felt in the thirties or for that matter the way the unemployed feel now or will feel in the future. This interview is quoted from a New York newspaper.

"It makes me feel cheap. I kinda hate to face people when I go out. I feel like a different kind of person. When you go out and work for money, you can spend a dollar and enjoy it. You can't enjoy it when it's given to you like this.

"The day seems so long and the nights are longer. It's tough to see men go off in the morning and see them happy and laughin' and talkin'. After a day's work, I feel like eatin' and havin' a good time and goin' to bed and sleepin'. But, when you do nothing, you don't feel hungry and you don't feel sleepy.

"I think relief should be for old people, not able to work. I put off makin' out
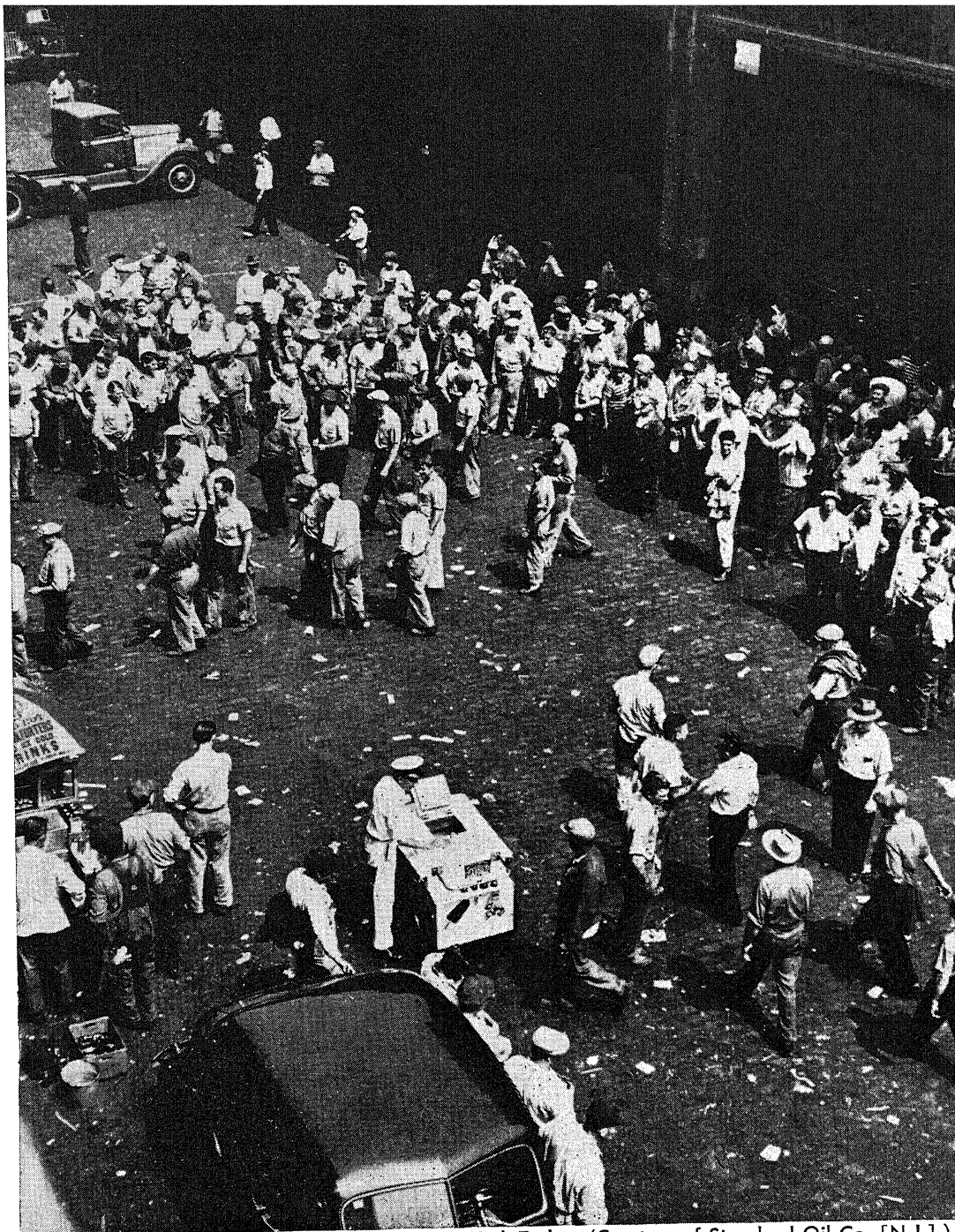
*Figure 7.1.* Some of These Men Will not Work Today. (Courtesy of Standard Oil Co. [N.J.].)

my application as long as I could. I put it off for several days. Until our last dollar was gone.

"I tell you the truth, to get off relief, I'm willing to go anywhere and do anything. I'd go on a farm and just work for my keep, so that we'd be together and have something to wear and enough food to eat . . ."

And then turn to his winsome, dark-haired wife:

"Tom's lost 7 pounds since he got laid off. He's sorta cranky, too. He just sits there. Before, he used to enjoy it at home, even if we just sat and read. We used to have friends in and play cards and serve soft drinks and beer.

"Now? I couldn't even sip beer. A bottle costs too much. For a few cents more, I can get a container of milk for the boy. Hardly anyone knows we're on relief. We're so ashamed . . ."

So the Joneses wince when the neighbors whisper and the grocer refuses credit. And they withdraw to their dark, tidy, little apartment with its plaster figures of saints and the goldfish swimming in the makeshift bowl.

At first, Tom went out daily to register at agencies. Nothing. He searched want ads. Nothing. He went through his savings, which amounted to little more than $25.

"The middle of last month, I got my first relief check," he said stonily. "It was a half check. $74. This month we got $132. I didn't want to touch it. I gave it to my wife. She bought eats and tried to make it last till I get something better. We had to stop the milkman from coming 'round. We had to cut down the boy from two quarts of milk a day to one."

Junior, placid and smiling, dimpled as his father rubbed his head.

"My sister saved money and came for Sally. She's taking care of her until I can get a job. It's terrible to have my family split up. We're not the happy family we used to be. I'm accustomed to doing a day's work. I feel closed in this way."

Naomi said quietly, "I miss Sally awful."

"We all chipped in—Naomi's aunt and all—and saved enough money to call Sally yesterday," said Tom. "My sister said she's lonesome for us. Sally is crazy about her mother."

"She said she'd call us tomorrow," Naomi said.

Everyone concentrated on Junior for a few minutes. "We buy him an ice cream twice a week," said Naomi, brightening. "But we can't get him any new toys."

Tom began pacing about the room.

"I used to smoke a pack a day," he volunteered. "Now I make one pack last me two days. We have potatoes every day and meat only on week ends. Meat loaf, mostly. We used to have company. Now we don't go no place, because we don't want to be beholden to people we can't invite to our place. I never go out, unless I go to the store to buy something or go out looking for a job. We have no hope for the future."

He stood still, smiling at Junior. "Really," he said in his soft, pleasant drawl, "I just don't enjoy life at all."[1]

[1] Reprinted by permission from New York *Post*. Copyright, 1949, New York Post Corp.

### The Course of Unemployment

There are individual differences in the effects of unemployment, but it is nevertheless agreed that a general pattern of behavior characterizes most of the unemployed. One factor that governs both the individual differences and the general pattern is the length of the period of unemployment and its meaning to the person involved. Most of the researchers in the field agree that there is a tightening of individual wants and needs during unemployment.

For most people, the course of unemployment runs along the following lines: First, there is a feeling of shock, regardless of how imminent and definite the chance of being laid off appeared. Most workers pick up many hints about the possibility of unemployment. They realize that the firm's business condition is such that there must be a reduction of its employees. Even the worker whose job is stable because of either seniority or ability finally comes to the conclusion that it can last at best only another week or possibly a month. Seeing other employees dismissed bolsters this belief. Nevertheless, this period of warning does not eliminate the shock of the "pink slip." In addition to the empty feeling in the pit of the stomach and the questioning of the reasons and the fairness, there is a kaleidoscopic review of the events, and serious doubts as to the wisdom of having taken the job in the first place. When unemployment is not widespread, the first behavior of the individual is to rationalize and decide that it is about time to take the much-needed vacation. This is followed by an appraisal of his abilities and the formation of a plan for an active attack on the hardest job of all, finding a job. At this time he is likely to get in touch with various friends and acquaintances and make it known that he is available if they happen to hear of a good job. But when unemployment is widespread, this "vacation" period is likely to be cut down considerably or eliminated, the job hunt starting immediately.

The second stage is the active search for a job. Most people are likely to begin looking for one that is better than the one they had. Then they look for one similar to it. When unemployment continues, they give up a little more and seek any job in the same industry, with the hope of working into a better job later. If the person still cannot find a job, he will look for any job anywhere. During this period, the individual is rather unresigned. His spirit is unbroken, and although he is unhappy about his predicament he is still hopeful of success.

The next stage in unemployment may be characterized as the breaking down of the individual. Having failed in his efforts to find a job, he be-

comes anxious and pessimistic and begins to lose hope. Whereas the unbroken individual will actively look for a job or try to change his social world rather than attribute his unemployment to his own limitations, the broken individual is depressed, indifferent, and even apathetic. He begins to adjust himself to this new, limited, and unpleasant way of life. In this final stage of unemployment he can be regarded as fatalistic or distressed. In either case, he has adapted himself to a life much narrower than his former pattern of living. He becomes a hopeless individual—disorganized and chaotic.

It is impossible to predict how long each of these stages will last in any particular case. They vary in length from individual to individual, depending upon previous background and experience. Each stage lasts longer for a person who has had more success than failure in the past; in fact, he may manage to avoid the second or third stage. However, the person with more failure than success will go through these stages in a relatively short time.

### Instability of the Unemployed

It is generally agreed that the unemployed are more unstable emotionally than people who are employed. However, whether they are that way because of their unemployment, or whether they were emotionally unstable to begin with and this was a contributing factor to unemployment is much like the "chicken and egg" affair. Data on the unemployed must obviously be based on case histories or observations. Since the experimental method cannot be used, many of the present data and the conclusions drawn are subject to questioning.

The instability of the unemployed seems to have two outstanding characteristics (3). One is the loss of a sense of the passage of time, and the other is indulgence in irrational spending. The termination of the daily working routine disrupts the time schedule. When a person is working, he gets up at a certain hour, eats at certain hours, and finishes work at a definite time, all of which establishes his daily activities in a relatively fixed manner. Working often adds meaning to a day. For example, Thursday may be pay day, and Friday is the day before the week end; Monday starts the work week, and so on. When he is unemployed, the days of the week do not have this meaning. Saturday, Thursday, and Tuesday have merely calendar significance, little personal meaning. The hour of day has as little personal meaning as the day of the week.

During the early period of unemployment, shame and embarrassment

over being unemployed often develop. Because of his own feelings or because of pressure from his family, the unemployed individual sometimes conceals his status from others. To do this successfully, he leaves at the usual time in the morning and comes home at the usual time at night. This gives him eight or ten hours that must somehow be filled in. Job seeking occupies the first fifteen minutes or possibly the first hour. The balance of the day must be killed in some way. The morning shows at reduced prices in "downtown" motion-picture theaters are a by-product of the depression. Job seekers found it possible to spend three or more hours of their day in this manner. Unemployment is also responsible for the "Society of Sidewalk Superintendents," for huge crowds would gather at places where construction was under way, and would stand and watch the work for hours at a time. Possibly the fact that people derived satisfaction from watching others work is one of the explanations, but there is another explantation—the people just had to pass the time somehow or other.

The second characteristic of the instability of the unemployed is irrational spending. An individual who is looking for a job is often forced to borrow money. When he does he is grateful to his beneficiary and invariably promises to return the money in the shortest possible time. Misunderstandings occur when this money is not returned and the lender believes that the debtor is spending unwisely whatever money he does have. An unemployed man may from time to time obtain a few hours or days of work. When he does so, he is just as likely to go on a brief spending spree as he is to conserve his funds. He reasons somewhat as follows: "Since I've been deprived of so much for so long, indulging in a little luxury is surely justified." Such reasoning is never approved by the person who has loaned the money, and so further misunderstandings occur which intensify the difference between them.

In our society it is polite to offer cigarettes to strangers under many conditions. For example, someone sitting on a park bench may strike up a conversation with the person beside him. When one of them starts to smoke, it is only polite for him to offer a cigarette to the other. However, many people believe that an unemployed individual should not spend his money for cigarettes; he should use it for other needs such as food. They object to a person's asking for a cigarette if he is unemployed. Actually the habit of smoking may be intensified during periods of tension; hence if an individual is more tense while unemployed, we can understand why he should want to smoke more rather than less during this time. The point is that many expenditures of unemployed people are regarded as irrational

because of the lowered income. From the point of view of the employed they are irrational, but from the point of view of the unemployed they are not.

The unemployed often indulge in hobbies of a somewhat expensive nature. Raising pigeons, for example, is time-consuming and allows a jobless person to fill in the time. But it does involve some expense, and so the argument between him and the person to whom he owes money continues unabated.

Another example of irrational spending is seen in the amount of money that unemployed parents with reduced and indefinite incomes spend on their children. Often the money spent for children's celebrations, such as birthdays and religious ceremonies, is out of all proportion to the original need, but this extra spending seems to bolster up the parents and allow them temporarily to regain their status in society, even though the future does not warrant the excessive spending.

### Intensification of Habit

The general consensus reached in connection with the behavior of the unemployed is that habits are intensified. For example, a person who does little reading when he has a job is likely to read even less when he is out of a job, even though he has more leisure. Similarly, a person who reads considerably when employed will read a great deal more when unemployed.

This also seems to apply to the attitude toward religion. Those who are firm believers when they have a job will probably turn even more to religion during unemployment, and those who are not religious are likely to become even less so during unemployment.

There is no conclusive evidence with reference to changes in moral code during unemployment. Marriages are postponed during depression, but divorce rates are lower than in periods of prosperity.

Apparently women, because of cultural conditions, suffer less than men during unemployment. The average woman regards her work as temporary; most women resign from their jobs when they marry, or shortly afterward. Since this does not hold for the men in our society because they are expected to support a family, the impact of unemployment on the men must be greater because a permanent job means more to them.

### Children of the Unemployed

One of the most serious consequences of unemployment is its effect on children. Although the children are not themselves unemployed, they suf-

fer deeply when their parents are not working. Unemployment does not affect children as it does adults—there is no loss of the sense of the passage of time and no irrational spending—but in many respects the problems it raises for the children are more complex. The insecurity and anxieties of unemployed parents are likely to be reflected in their children. One such consequence is the lowering of school grades. Many factors contribute to this. The parents' preoccupation with other things often prevents their paying attention to the child's school work. The emotional disturbances in the home are often not understood by the child but nevertheless affect him and his school functions. Truancy and other delinquency problems are greater among unemployed than employed families, and this is reflected in lowered grades. Children are both sensitive and vain at the same time. When they have a new toy, a new book, or a new item of clothing, they are sometimes almost cruel in showing it to the other children. When a child has nothing new to show off, it causes him sorrow and this ultimately is reflected in his behavior.

In one school, for example, replacing worn-out shoes with new ones cut down the truancy rate and increased the grades. The children with worn-out shoes were miserable at having to go to school and looked for excuses not to go because the children with good shoes continually made fun of them. In another community, a principal noticed that some of the children ate lunch even faster than the rapid rate to be expected of children who are anxious to finish eating so they can play. He could not understand this because all the children brought lunch kits to school. However, a secret examination of their lockers showed that most of these particular children carried empty lunch kits. During lunch hour they would wander off for just a few minutes to "eat lunch" and then come back to play. In other words, they were ashamed to admit that there was not enough food for lunch so they got around this by carrying empty lunch kits.

The most serious consequence of unemployment, of course, is not the lowered school grades. Chances are that the lower grades are merely the reflection of decreased efficiency because of poor health. Inadequate diet, lack of medical care, and the disruption of the family are bound to have serious consequences on children.

### Workers on Relief

Grace Adams has written a book entitled *Workers on Relief* (*1*) that is a tremendously human document on the experiences of the unemployed in their quest for jobs and their final resort to home relief or work relief. She presents a critical review of the WPA and describes the limitations and

disadvantages of the program, as well as its advantages and its social implications. The conflicting philosophies regarding the type of work which should be undertaken under the WPA and the various changes in its program are vividly presented, not from the point of view of a historical report, but rather in terms of the impact of such a program on the people involved. The book also contains case histories illustrating the trials and tribulations of people seeking work.

Most of the unemployed preferred not to accept relief because they felt that it was charity and hence degrading. The WPA program attempted to remove this feeling of accepting charity. The program was sometimes involved in almost vicious lengths of red tape and its purpose was sometimes defeated by chiselers. However, it at least allowed the masses involved to feel that they were working. Although in most cases the lack of meaning in the work was one of its outstanding characteristics, the opportunity of working on WPA not only provided some money but enabled many people to avoid the more serious aspects of unemployment. In the future, should unemployment again become rampant, such studies as this by Adams will be valuable in avoiding previous errors.

Many people believe that the best way to deal with the problem of unemployment is through private or local agencies rather than through the federal government. In this group is the W. E. Upjohn Unemployment Trustee Corporation of Kalamazoo, Michigan (4) (9). The purpose of this nonprofit organization as set forth in its charter is: ". . . for research into the causes and effects of unemployment and to study and investigate the feasibility and methods of insuring against unemployment and devise ways and means of preventing and alleviating the distress and hardship caused by unemployment; to create, experiment with, and put into effect any plan or device that the Board of Trustees may determine feasible to accomplish that purpose" (9).

Its approach to the problem of unemployment is on the community level and includes the following activities:

1. To discover and evaluate all the measures which can be taken in a local community.
2. To determine the applicability of such measures in Kalamazoo.
3. To promote the application of these measures.
4. To make available in published form any findings which may be of value to other communities.

There is no need for any controversy as to whether government funds or private funds should be used to attack unemployment and alleviate its

impact. If our main concern is the problem itself—as it should be—we can then admit that there are two ways of solving the problem, each of which has advantages and disadvantages.

Various economists as well as others have from time to time offered hypotheses to explain variation in the size of the labor force. Woytinsky has proposed an interesting supposed effect with respect to family relationships upon unemployment (*11*). He writes:

> Among the persons available for employment at any given time, there are in addition to the workers who regularly engage in gainful pursuits a number of others who for one reason or another temporarily seek gainful employment. In periods of exceptional demand for labor additional workers are an important part of the reserve from which labor shortages are met; in depressions the appearance of additional workers on the labor market intensifies the competition for the available jobs and increases the amount of visible unemployment. . . . By "additional worker" is meant the person who is on the labor market because of the unemployment of the usual breadwinner in his family and who otherwise would not be seeking work. . . .

This quotation implies that during a depression the number of persons seeking jobs tends to outnumber the number of persons who have lost their jobs. Heneman (5) attempted to check Woytinsky's hypothesis by conducting monthly interviews over a nine-month period with a selected panel containing 1075 individuals in slightly over 420 families. Heneman's data simply do not support the hypothesis, and though one study does not completely disprove an idea, it can cast a justifiable shadow of doubt. The main point to recognize is that statistics in this field, as in others, are often disputable. The "ins" would like to minimize unemployment and the "outs" want to raise the figures to get to be "in." Hypotheses such as that offered by Woytinsky can try to establish that the extent of unemployment is not as serious as indicated. In this instance the proving or disproving of a theory is not as important as using concerted effort on all fronts to keep unemployment to an absolute minimum.

### Summary

During unemployment, personality, attitude, and behavior changes occur. Unemployment affects not only the individual but society itself. The family as well as the community suffers as a result of it. The unemployed person is likely to follow a characteristic course of behavior that starts with shock and culminates in distress and breakdown. Loss of a sense of the passage of time and irrational spending characterize the unstability of the unemployed. Habit is likely to be intensified during unemployment;

this has been demonstrated in such varied fields as reading and religion. Women are able to stand up under the impact of unemployment more readily than men; this must be understood as a cultural condition rather than a sex characteristic. One of the most tragic aspects of unemployment is its effect on children whose parents are unemployed.

Of the serious reviews of various work relief programs that have been made, one of the better reports is that by Grace Adams; it gives considerable insight not only into the WPA but also into the people involved.

Two means of helping to solve the problem of unemployment and alleviate its force are funds of the federal government and private funds at the community level. Both have advantages and disadvantages.

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# PART III •

## • Understanding the Employer

A SYSTEM of industrial psychology must include an awareness that the leader plays an important role and that all leaders are not equally effective. The employer and employee continually interact, and often improvement in leadership improves the behavioral relations of employees. Whether the leader owns the company or is only the foreman, he is regarded and perceived as the "boss."

Leadership should not be studied solely by the armchair philosopher. Hypotheses must be tested and differences in performance of employees as a result of differences in leadership must be established

The chapter on industrial warfare is included in this section because of the hypothesis that a better understanding of the employee and employer can lead to considerable reduction in industrial misunderstanding of each other.

# CHAPTER 8 • Leadership

**ANOTHER** type of problem to whose solution the industrial psychologist can contribute is leadership. The role of leadership in industrial relations is gaining increasing recognition. Just as society looks for a leader to define its purpose and lead it forward, so both management and labor have been concerned in the selection and development of men who can successfully attack the many perplexing problems that confront them. The psychological aspects of effective leadership and of the training of leaders deserve serious thought.

We all know that leadership is necessary in any group. In the industrial setting, either the employer or the employees will choose the leader. In the ideal situation both select the same individual. However, this does not often happen; the leader who is selected and the one who emerges from the group will have very different characteristics. If the leader is handpicked by management, his loyalties will be predominantly to management and his characteristics may be such as to encourage conflict rather than coöperation. By the same token, if the group chooses a leader, his loyalties may lie solely with the group, and the result may be conflict rather than coöperation. The militant labor leader is undoubtedly a product of the conflict between management and labor; when these two groups learn to coöperate, such a person will no longer be a successful leader.

Effective selection depends upon management's understanding of leadership and its ability to evaluate men. For its purposes leadership may be classified at three levels: top management, middle management, and the front line. Top management usually means the "Big Boss"; middle management is just called the "Boss"; front-line management includes foremen and supervisors, who are usually referred to as "boss men" or "lead men." These three types of leaders operate on different levels and

so they have different responsibilities and duties. Nevertheless, all three face basically the same problem—how to deal with and lead people.

A leader who loses contact with his group is no leader; hence it is important for any executive who serves as a leader to remember that he must maintain close contact with his group if he is to function as a leader. It is also important that he be able to delegate authority. Many leaders fail not because of limitations on their own general ability but because of their inability to delegate authority. Leadership is not a one-way affair; it involves interaction of the leader and the group.

Barnard (*2*) says that executive work has three aspects: communication, coöperation, and purpose. The executive is responsible for devising a system of communication which will allow the organization to function smoothly. Since the executive is always concerned with securing services from individuals, he must show a strong willingness to coöperate with people. The executives formulate the general purposes of the organization, and they must indoctrinate their subordinates with these general purposes so that the organization will function in a unified manner.

### Leadership and Political Atmosphere

Possibly one of the great paradoxes of our times is represented by the leader who extols and defends the virtues of democracy by authoritarian means. Although this book is written in the context of industry, it recognizes that leadership patterns, whether they are demonstrated in the home, in government, or on the job, can run the gamut from the "little dictator" to democracy. Further, the label by which the leader identifies himself often merely confuses because his actions seem to be unrelated to his professed or stated goals. Many self-appointed defenders of freedom of the little man, the worker, etc., seem more to restrict freedom than to defend it. Although the reader may be thinking of political implications the writer is more concerned with leadership patterns in industry. Yet he will not deny his bias for democratic leadership in the home, schools, industry, and government.

Bradford and Lippitt (*6*) refer to four types of supervision: hard-boiled autocrat, benevolent autocrat, laissez faire, and democratic. For each of these types they postulate the characteristics, group reactions, and group personalities involved. Inspection of the differences due to kinds of leadership is fruitful.

The hard-boiled autocrat constantly checks on production, gives orders,

and expects immediate acceptance. He is a rigid disciplinarian and believes that praise will spoil. He is status minded and doesn't trust the employees' initiative. The group reaction is submissive but resentful. Individual responsibility is at a minimum but buck passing and backbiting are common. The group tends to be insecure, tense, aggressive, and egocentric.

The benevolent autocrat dominates all employees and is the source of all standards. Failure to meet these standards makes him feel hurt, angry, or surprised and is interpreted as a personal disloyalty. The benevolent autocrat rarely recognizes his autocracy. The group is submissive and lethargic and shows no initiative without checking with the supervisor. Only those who see through him dislike him intensely. In this group the employees are dependents who demonstrate a slow regression to more submission, dependency, and inability to accept responsibility.

Laissez-faire leaders often busy themselves in paper work and so stay away from employees. Such a leader sets no goals, makes no decisions, and believes he is the "good fellow." The group has scapegoating, instability, and a sloppy, low output. Frustration, failure, and insecurity are typical in this directionless group.

Democratic supervision shares group decisions, gives reasons for decisions, and devotes time to planning. Enthusiasm is high and basic needs tend to be satisfied. Confidence and security are typical.

According to Bradford and Lippitt, democratic leaders encourage employees to work in a democratic framework. They recognize that they play a role as a leader which fosters individuals. They recognize that:

1. Having problems is permitted.
2. Meetings are necessary for group thinking and action.
3. Group goals should be definite.
4. Performance standards must be accepted and determined.
5. Reasons for decisions must be understood.
6. Progressive growth results in independence and responsibility.

The goal should be toward democratic leadership and away from autocratic leadership. However, it must be remembered that democratic leadership is a more difficult form, possibly because varieties of autocratic leadership tend to be more prevalent. Further, not all people understand democratic leadership. Some definitely believe it is a sign of weakness in the leader. Others simply cannot be anything else but de-

pendent and submissive. They only want to be told to do things and assume that what they are told is easier and right.

### Conditions for Effective Leadership

Douglas McGregor (22) approaches the problem of leadership through the subordinate-superior relationship. The outstanding characteristic of this relationship is the subordinate's dependence upon the superior for the satisfaction of his needs. Psychologically, this dependence has great significance because of its emotional similarity to the child's earlier dependence upon the parents. The subordinate's dependence has two results: the necessity for security and the necessity for self-realization.

The subordinate frequently regards the actions of his superiors as sources of threat; conversely, conditions which encourage a feeling of security in him lead to more efficient functioning. Effective leadership attempts to remove the conditions of threat. The three major aspects of the subordinate-superior relationship at any level which affects the security of the subordinate are atmosphere, knowledge of what is expected, and consistent discipline. When the superior creates a favorable atmosphere rather than one of tension, the subordinate feels secure. The creation of this atmosphere is closely related not so much to what the superior does as to how he does it. If the atmosphere is favorable and trusting, orders and rules will not be questioned nearly as much as when the atmosphere bristles with tension and uncertainty.

An effective leader makes certain that his subordinates know company policy and philosophy. He familiarizes them with company rules and regulations. The employee's job is clearly defined so that he understands his duties and responsibilities as well as his place in the organization. The effective leader creates a feeling of security in the employee by letting him know exactly how he stands. Some employees feel insecure because, although they believe they have been doing a good job, the boss has never told them so.

Another quality of a good leader that promotes a subordinate's security is his ability to take the employee into his confidence, especially in something that is likely to affect the security of the individual. Changes should not be made overnight; the employees should be informed in advance as to the reasons for the change and when it is likely to take place.

The third requirement for the subordinate's security is consistent discipline on the part of the superior. The employee should be in a position

to predict what is expected of him so that, in turn, the actions of his superior will be predictable. He must be in a position to know when management will back him up; he will resent any buck passing or being let down. A good leader is never concerned with the problem of maintaining discipline; consequently he need not worry about a subordinate's taking advantage of a situation. When the punishment for an infraction of the rules is known in advance and is meted out shortly after the incident and without favoritism, there is little likelihood of resentment on the part of anyone concerned. In a favorable atmosphere, mild discipline will usually prove sufficient. But if the atmosphere is unfavorable, the severest discipline will not achieve its purpose; on the contrary, it may encourage further infractions of the rules by a greater number of people.

In a subordinate-superior relationship which produces security, the subordinate individual shows a real need for independence. In other words, in a relationship involving a dependent individual, healthy encouragement leads to his independence much more often than it does to further dependence. The person who has been made to feel secure in his dependent role will manifest his independence by actively participating in problems which concern him and by using the right of appeal. He has been encouraged to accept responsibility in his role and he shows this by giving his superior many ideas which, under unfavorable circumstances, he would not do. It is equally important for the subordinate in a subordinate-superior relationship not to be allowed to develop feelings of frustration. Many honest differences of opinion can occur in such a relationship and the subordinate must feel that he can appeal his superior's decisions—to a higher level of management or an employee grievance committee—without jeopardizing his own security and the harmony of the relationship.

Not all people want to be leaders. Many become extremely unhappy when they are vested with such responsibilities. It is important for the leader to recognize this so that he will not regard such an attitude as indicating lack of drive or ambition in a subordinate. It is equally important for people who do not want to be leaders to recognize that people who want to lead are not necessarily intent on taking advantage of others. In a democratic society, the person who attains leadership by this means is not truly a leader and will encounter considerable conflict with the group as well as with other leaders. The concept of status is also involved in leadership. Whereas some people gain considerable satisfaction from

their higher status in the group, others derive equal satisfaction from being merely a member of the group and having no higher status than do the other members.

### Leadership Characteristics

Research in the field of leadership characteristics has indicated a trend. The trait or personal-characteristics concept of leadership has continued to lead nowhere. More psychologists recognize that looking for specific traits even as measured in psychological tests does not enhance the understanding of leadership qualities. From widely different sources more work and enthusiasm seems to be centered around a more broad and meaningful concept of leadership. This view regards leadership as behavioral, situational, or related to the interaction of the leader and the group.

The layman still believes that such traits as superintelligence, initiative, aggressiveness, tact, etc., identify the leader. Various disciplines less sophisticated in experimental methodology still extol the virtues of the trait concept. The simplest way to dispel this view is to name leaders in politics, the community, or the company. Then assign the traits that most typically identify these people. The result generally is complete disagreement in trait assignment from leader to leader even though there is general agreement that one leader speaks well, another is aggressive, another ruthless, and still another kindly.

Stogdill and Shartle (27) believe that leadership is not a unitary human trait, but is rather a function of a complex of individual, group, and organizational factors in interaction. They regard leadership as a relationship between persons and as an aspect of organized activities, structures, and goals. Part of their research resulted in the construction of the RAD index. This measures Responsibility level, level of Authority, and Delegation to subordinates. Although the work of the Ohio State group has more scope than the RAD index, this phase is cited merely to illustrate the view that leadership is being studied through work patterns rather than personal traits *per se*.

Browne (7) in a series of studies of 24 executives of a rubber company applied the RAD index. He found that the executives estimated their responsibility and authority as greater than their delegation of authority. Interviews with these executives revealed general social patterns which were regarded as part of the job. Essentially, working relationships extend beyond the confines of the office or factory. In other words, executive

duties extend to the person's social life. This is apparently a research way of saying that executives have duties that impinge upon and in part make up their social life.

Fleishman (*13*) has studied leadership attitude and behavior. He finds that "consideration" and "initiating structure" are meaningful and major concepts in the understanding of leadership. By "consideration" he means the extent to which a supervisor is considerate of the feelings of those under him. By "initiating structure" he means the extent to which the supervisor facilitates or defines group interactions toward goal attainment. His research concludes that these two concepts are independent of each other; that is, any one person may behave in a manner to demonstrate either or both of these characteristics.

In applying these concepts at four plant levels he found people in the higher plant hierarchy inclined to less consideration and more structure. The attitudes of the foreman group on each dimension fell somewhere between what the workers expected and what their own supervisors expected but were much more like the attitudes of their supervisors.

Fleishman concludes, "It is possible that future research will indicate that combinations of measures of such things as group characteristics, needs and expectations, leadership attitudes, behaviors and perceptions, pressures from supervisors, etc. can yield more successful predictions where ordinary testing procedures have failed in the complex field of leadership and group effectiveness."

The Institute of Industrial Relations at the University of California (*1*) is also conducting meaningful research in the area of leadership. Its definition of leadership is interpersonal influence directed toward the attainment of a specified goal or goals achieved through communication and taking place in a situation. "Perceptual flexibility" and "sensitivity" are regarded as important concepts in understanding leadership. Perceptual flexibility is the relative number of perceptions that a person such as a leader has. Sensitivity deals with the correctness of the perceptions. Leadership, according to this view, is related to perceptual and cognitive processes.

The University of Michigan group (*20*) has been concerned with determining characteristic differences of high- and low-producing supervisors. It finds that more time spent in planning, greater degree of delegation of authority, more employee oriented than production oriented, and the attitude of group pride are four factors related to effective supervision.

The Survey Research Center (29) of the University of Michigan in a study that in part concerned itself with first-line supervisors in a large insurance company found that those in high-production work groups differed from those in low production groups in that they:

1. Are under less close supervision from their own supervisors.
2. Place less direct emphasis upon production as the goal.
3. Encourage employee participation in the making of decisions.
4. Are more employee centered.
5. Spend more of their time in supervision and less in straight production work.
6. Have a greater feeling of confidence in their supervisory roles.
7. Feel that they know where they stand with the company.

The common denominator of this list would appear to be behavioral, situational, and group-leader interaction rather than personal trait characteristics.

No attempt is made to add such concepts as responsibility level, level of authority, delegation of authority, goal and achievement index, consideration, initiating structure, perceptual flexibility, sensitivity, planning time, employee orientation, or group pride and reach a total executive pattern. What is intended is to emphasize that none of these concepts are "inherent" personality traits residing solely in an individual. Rather, leadership characteristics are best regarded as behavioral, situational, and the interaction of the leader and the group. This naturally leads to the view that training people is more appropriate than looking for "born" leaders.

### Rules of Supervision

It is not at all necessary for a supervisor to be the arbitrary and dictatorial individual which many people believe him to be. In fact, considerable evidence presented in recent years indicates that this type of leadership is inefficient. Furthermore, the supervisor need not be incredibly dynamic, forceful, and aggressive. He just happens to be the person whom the group looks up to and respects.

One important rule for a supervisor is to listen patiently to what his subordinate has to say. He should never interrupt and he should manifest interest both in what is being said and in the individual who is talking.

A supervisor should never make hasty decisions, especially when

they concern a subordinate's conduct. A superior who discourages his subordinate from talking to him will never find out the cause for a complaint. Effective supervision recognizes that most complaints have either an emotional or a factual basis. Even complaints which are purely personal and obviously beyond the realm of the supervisor and the company should be listened to. Although the supervisor may not be able to change the situation, the subordinate is often happier because he has "gotten it off his chest"; what is more, he decides that the supervisor is a "swell guy" because he has listened to him.

A supervisor must never argue with employees. Arguments are likely to create a feeling of insecurity and they serve to frustrate the employee because he may believe that he has no chance of winning. Orders can be issued without having them sound as if they were the culmination of an argument, even though there has been no argument.

Another important rule for the supervisor is always to voice disapproval in private, although praise may be expressed publicly. Being called down in front of other people—regardless of whether the criticism is warranted or not—is often much harder to take than the criticism itself.

### Communication

Without communication, effective leadership cannot be maintained. Any organization requires a system of communication in which orders and information can travel from higher to lower levels, and from lower to higher as well. Leadership is often limited by its inability to channel information correctly throughout the organization. Material that is transmitted down is usually referred to as an "order"; that transmitted from subordinate to superior is usually referred to as a "report." Order or report, both are important in the functioning of an organization, and the smooth flow of work often depends upon their accurate and rapid transmission. It is the direct responsibility of the superior to devise an efficient system of communication and see that it is kept in operation.

Communication in an organization is effective when it meets a number of requirements. In the first place, the channels of communication must be known to all. Organizations function differently in this respect. At one extreme are the companies which require their employees to stay in line and communicate only with the employee immediately above or below them. At the other extreme are the companies which permit any employee to transmit communications to anyone else, regardless of position. Whatever the system, every employee must be familiar with it.

The system of communication must reach all the employees with dispatch. If a communication involving many employees is not received by all of them at approximately the same time, rumors will flourish and employees will feel insecure; they may decide that favoritism is being shown somewhere along the line. To avoid misunderstandings and make certain of correct transmission, the lines of communication should be as short as possible. The outstanding example of direct communication is the situation where the president of the company speaks over a loudspeaker system to all the employees. There is nothing like the feeling one has when he gets information "straight from the feed box."

According to Barnard (2), a person regards a communication as authoritative when four conditions exist simultaneously: (1) when he understands the communication, (2) when he believes it to be consistent with the purposes of the organization, (3) when it is compatible with his interests as an employee, and (4) when he is mentally and physically able to comply with it.

A direct responsibility of the leader is to establish a system for effective communication. Pigors (25) points out that communication should not be limited to the minimum of factual information nor should it be given at the last moment.

Possibly the most overlooked aspect of effective communication is that it is a joint process. Management is quick to recognize the need for communications to flow downward. Equally important is the need for communication to flow upward. Communication, therefore, must be regarded as a two-way process in which employer and employee have equal opportunity to convey their meaning, their feelings, and their actions to each other. A stumbling block which impedes communication and prevents understanding is the suspicion that may exist in either of the parties. All efforts should be exerted to remove the basis for suspicion. Free-flowing communication both upward and downward goes a long way to promote understanding. It may take place on a formal or informal level, as is demonstrated in Figure 8.1.

### Do's and Don't's

It is very difficult to devise a list of specific recommendations for the successful leader because such a list must be general in nature, whereas most situations which confront the leader are specific. A further difficulty is that, while a person may memorize the list, there can be no guarantee that he will be able to apply the rules to the specific situation

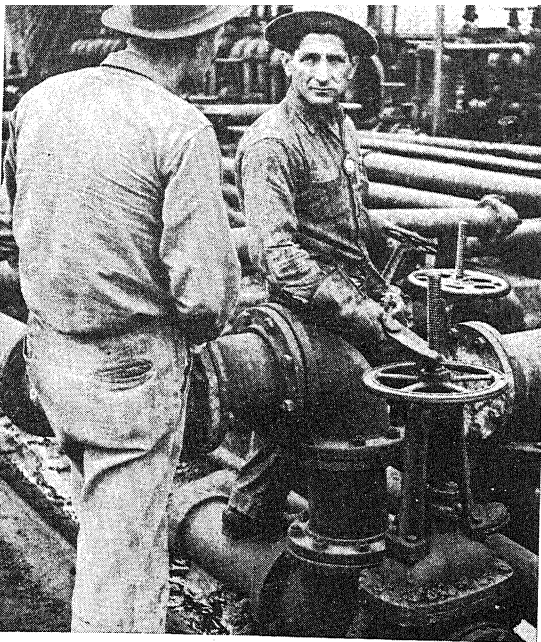



*Figure 8.1.* Communication May Take Many Forms—It Should Always Present the Opportunity for a Two-Way Exchange. (Courtesy of Standard Oil Co. [N.J.].)

confronting him. In spite of this, it is nevertheless advisable to summarize the points made previously by briefly listing what a leader *should* do and what he *should not* do.

A leader should base his actions on the following five principles:

#### FAIR EVALUATION OF WORK

A subordinate is constantly seeking an appraisal of his work; hence the superior should not hesitate to give praise or criticism periodically as well as whenever the situation calls for it. He should remember that people may be praised publicly, but that no one should be criticized publicly.

#### SUFFICIENT DELEGATION OF AUTHORITY

A "perfect executive"—if there were such a thing—would be a person who has no work to do himself because his subordinates do it for him. His function is to assign the work and see that it is done properly. But once the superior has delegated authority, he should back up the subordinate at all times. However, if the subordinate misunderstands or fails to carry out instructions, he should not be upheld to the detriment of the organization. Under such circumstances the delegation of authority should be changed. News of such changes should be communicated to the employees in advance.

#### FAIR TREATMENT FOR ALL

The leader must remember that one employee is as important as any other employee, even though one may have higher status in the company. All people deserve and demand equal consideration. Regardless of status, every employee likes to feel that the company considers him important; he will resent being treated as if he were unimportant.

#### AVAILABILITY TO ALL EMPLOYEES

The leader should be readily available to all employees. Just as it is his prerogative to send for a subordinate, so it should be the subordinate's prerogative to make an appointment with the leader for any cause he deems justified. The "Big Boss" in a large organization would do well to have one of the telephones on his desk connected directly with the main switchboard for employee use. The feeling that all the employees have an equal right to talk to the "Big Boss" often makes it unnecessary for an employee to call him. A leader who is readily available to his subordinates

impresses them with his interest in their problems and thereby promotes a more effective subordinate-superior relationship.

### DISCUSSION OF EMPLOYEE PROBLEMS WITH EMPLOYEES

Management should not make decisions concerning employees without taking the employees' wishes into consideration. Many times, taking subordinates into the leader's confidence has resulted in suggestions that have solved the problem more successfully. The feeling created in employees as a result of such a policy has outstanding rewards, not only for the employees but for management as well.

A leader should *avoid* such common practices as the following:

### DEPENDENCE UPON SUPERIORITY

Some people take advantage of their superior position; they believe that their orders should be obeyed simply because "I am the boss." A successful leader does not have to depend upon his superior position; rather, his superior position will be recognized.

### SIMULATION OF KNOWLEDGE

Subordinates are quick to estimate the ability of a superior; hence a wise leader will not try to make believe that he knows more than he really does. An effective leader is one who has the technical knowledge required by his job; subordinates will look up to such a leader. Sometimes they actually know more about the specific work they perform than the superior, for he is not expected to know all the intricacies of every job.

### INTERFERENCE WITH WORK

A leader delegates work to his subordinates. Once this has been done, within reasonable limits he should allow the subordinate to finish the job by himself. Interference on his part is often resented; furthermore, it causes distraction. A leader must not interfere with the smooth flow of the work done by his subordinates unless he wants to curtail production.

### FAVORITISM AND DISCRIMINATION

The leader, as an individual, will probably like some of his subordinates more than others. However, in the work situation, he cannot allow personal likes and dislikes to influence the distribution of work or to interfere with discipline.

#### PUBLIC REPRIMANDS

A subordinate must maintain his self-respect, especially in the eyes of his fellow workers. Just as children should never be punished in the presence of their friends, so employees who are subject to disciplinary action should be told about it in private. A public reprimand often serves only to lower the position of the subordinate. The superior should not even raise his voice when talking to a specific individual in a group.

#### PETTINESS

Subordinates expect a leader to be magnanimous. Harping on trivialities, continually going over minor details, and demonstrating in other ways that he does not respect the subordinate's ability often prevents a superior from maintaining harmonious relations.

#### CONFLICTING ORDERS

A leader must remember the orders he has issued. A subordinate is often confused when the leader, failing to remember a previous order, directs him to do something just the opposite. He is usually too embarrassed to call these conflicting orders to the leader's attention, but he usually decides that the leader does not know what he is doing. In some organizations lines of authority are not clear-cut, with the result that two people with equal status knowingly or unknowingly issue directly opposing orders. Such a situation can be avoided by establishing clear lines of authority.

#### SUPERFLUOUS ORDERS

An effective leader is one who issues few orders rather than a great number. Unless orders are within the scope of his authority, can be clearly understood, and are possible to carry out, they will not be obeyed. Too many orders not only tend to undermine that leader's authority but also create insecurity in the employee and prevent the exercise of a healthy independence on his part. An effective leader does not find it necessary to issue many orders.

### Selection and Training of Leaders

#### SELECTION

Psychological tests have been successful in the selection of many different types of employees, but to date they have not been of any great

help in the selection of potential executives. If this problem is solved, as it may well be, the type of test will be vastly different from that used in selecting other employees. The value of psychological tests in employee selection will be discussed in Chapters 10 and 11, and we shall see then that tests can be used for this purpose when a job criterion is available. No criterion of success at the executive level has been unequivocally established.

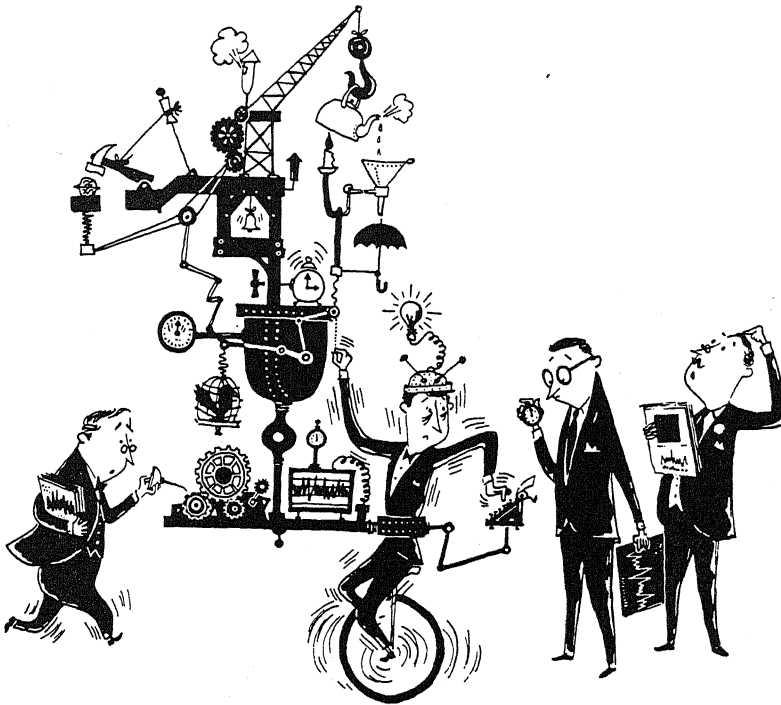



*Figure 8.2.* Training and Development Programs Can Get Too Complex.

In fact, it might be best to recognize that the philosophy of management in a particular company often determines the characteristics and behavior expected in its executives. A high-pressure company may require pushing and driving. A company with a different rationale would find such persons to be misfits. Psychologists can effectively describe a person's characteristics, such as intelligence level, ambition level, maturity level, and interests and abilities. Using these variables and their probable interrelations as a basis, psychologists can offer descriptive evidence that will enable management to decide whether it wants such a person for a

specific executive position. It appears safest for psychologists to describe individuals and for management to make the decision as to whether to hire them. If the criterion is known, then psychologists can do the matching. However, for most executive positions, the criterion is usually not clearly defined or it varies from company to company.

Although the literature reports many studies using tests to predict supervisory effectiveness, most of the findings are rather uninspiring. Possibly the major reason for this is the simplicity of the tests and the impossibility that a short intelligence test or a personality trait type inventory can really measure enough of what is demanded of the executive on the behavioral level. Typical of such studies is the one reported by Bruce (*10*). He used 23 predictor variables and found seven of them to be significantly (but not highly) correlated with the criteria. He found that the major contribution of +.290 to the multiple R of +.398 was made by the Otis Self Administering Test, a 20-minute intelligence test. Possibly the greatest value of his research is part of his concluding sentence: "Further research in this area should seek to find instruments that measure factors that can successfully predict the criterion. . . ."

A study published two years earlier in the same publication but not mentioned in Bruce's bibliography seems to be along such lines. Meyer's study presents possibilities (*24*) and at least is refreshing in an approach that is different. Meyer did not try to rework the same hash that has been served before and expect to come up with a new recipe. His measures of leadership ability included, among others, the development of a multiple-choice projective test of social attitude. Examples of the type of item included are as follows:

29. Harry's supervisor is near the retirement age. Most of the men will be glad when he retires because he is so grouchy. How would you expect Harry to feel toward him?
    ........ (a) He probably agrees with the rest of the men.
    ........ (b) He probably feels that he might be grouchy too if he were as old as the boss.
    ........ (c) He probably tries to avoid the boss.
    ........ (d) He probably figures that something must be troubling the boss.
34. One of the men in the department, Joe Smock, borrowed 10 dollars from Harry and promised to return it in a week. When the week was up, Joe told Harry he could pay back the 10, but that he would like to keep the money for another week if it were all right. Although Harry would have liked to get the money then, he didn't need it. What would you expect Harry to have told him?

........ (a) "That's all right."
........ (b) "I'd rather have the money right now if you don't mind."
........ (c) "Sure, Joe. Is there anything else I can do to help?"
........ (d) "I'd like to but I'm short myself."

Meyer views this test as a measure of social perception and he found that it was related to ratings of leadership ability used as the criterion. He infers that the way a person perceives a situation is determined by his attitudes. Implied is that change of performance as a supervisor should concentrate on changing attitudes rather than trying to teach skills.

Meyer presents evidence to indicate that the good supervisor regards others as individuals with motives, feelings, and goals of *their* own, whereas the poor supervisor is more likely to perceive others in relation to his own motives or goals.

Jenkins (*19*) has proposed the nominating technique as an approach to the problem of selecting executives. This technique is very similar to one proposed by Moreno much earlier, but Moreno did not have in mind the specific problem of industrial leadership. Jenkins' original purpose was to obtain information on the "combat suitability" of naval aviators, but he soon realized that this study was producing interesting data on leadership.

Interviews were held with naval pilots, the conversations being centered about the following questions:

> Assume that you are to be shifted to a new air group tomorrow and that you may select your own combat-mates to go with you to this new air group. Of all the men known to you in Naval Aviation—living or dead—what two men would you like most to fly wing in your new combat assignment? Why would you select these men?
>
> What two men would you least like to have flying wing on you? Why?

The pilots' selections showed diagrammatically the difference between the formal leadership imposed by chain-of-command and the informal, functional leadership set up by the men themselves. The squadron commander in one squadron was not nominated once; the executive officer received multiple nominations, but they were all negative. There were many small cliques in this squadron and all the "not-wanted" nominations were men within the squadron. This squadron was recognized as having low morale, and the nominating technique showed the absence of leadership.

In another squadron known for its high morale and excellent combat record, the diagram resulting from the nominating technique was very

different. The squadron commander was named most frequently as "wanted in combat"; the executive officer was the second most desired combat-mate. There was no evidence of subgroups and more than 50 percent of the "not-wanted" nominations were men outside the squadron. In this squadron the man who ranked third was a lieutenant, junior grade. Jenkins points out that if this young lieutenant were to become a leader solely on the basis of seniority, it would take an unwarranted length of time for his leadership to be utilized.

Many people believe that the best way to detect potential leadership is to find a man who already has followers. The nominating technique can do just that.

Jenkins recognizes that this technique cannot be used indiscriminately. He believes that the following five conditions are a prerequisite for its success:

1. The tasks involved represent high levels of skill.
2. The motivation to do well is in proportion to the cost of failure.
3. The same basic skills are required of all members of the group.
4. Individual members have firsthand knowledge of the performance of the other members.
5. The group has been closely associated over a long period of time.

It appears certain that when a group selects its leader, it does so not on the basis of popularity or personality but on the basis of a rather critical evaluation of all its members. Superimposing a leader on an already formed group may do much to change the general atmosphere. Such findings as these support the policy of promotion from within the ranks and even suggest that the group can aid in selecting the individuals to be promoted. Management should not forsake its accepted role of selecting the leader; but when, in selecting, it fails completely to consider possible candidates among the employees, its choice may not be very successful. It is possible, of course, that a group will be unable to reach a decision as to which member will make the most efficient leader, and under these circumstances management will have to bring in someone from the outside.

Bavelas (*4*) points out that optimal face-to-face relationship is obscured by viewing this as a matter of "personality" or knowing "human nature." Personal relations depend upon social skills which are not learned out of books any more than tennis can be learned from a book. Although lectures, the conference, or group discussion is successful in

presenting a viewpoint, it has the limitation of "talking about" rather than "doing." Bavelas favors role playing as a management training technique.

TRAINING

A very effective means of training a leader is by means of the technique variously called "reality practice," "role playing," or "the problem approach." A realistic problem is presented and the subjects are required to act out a solution to it. For example, a group of foremen who are being trained in effective leadership may be presented with the problem of an employee's infraction of a company rule. Rather than allow discussion on an unrealistic basis, one of the foremen is asked to play the role of the employee and another to take the role of the foreman. The two men set the stage by planning their handling of the problem, and then they act out the situation before the group. Afterwards, the group discusses the problem, paying special attention to what it considers mistakes made by the two foremen. The performance is then repeated; two other men play the two roles to see if they can avoid the mistakes made in the first presentation. Again there is group discussion, the members trying to determine which solution was the better and also to analyze the behavior which led to this solution.

In a variation of this technique, one man takes the role of the employee who has broken the rule; he is confronted by three different foremen, none of whom knows the approach used by the other two. The group then decides which was the best way to handle the situation or what particular aspects of each technique would contribute most to the solution. The three foremen are asked to repeat their performances, modifying them according to the suggestions of the group.

This type of training encourages learning at a very meaningful level. The person in charge of the training has a passive but nonetheless important part. It is up to the group to choose the problems which are of greatest concern to them; the leader must encourage active participation. At best, he can steer the discussion but he can never really direct it; therefore the spontaneous aspects of the training are allowed to emerge.

French (*17*) reports that in training foremen to handle interpersonal relations role playing has a number of distinct advantages over the more conventional methods of lectures, conferences, reading, and discussions. Role playing provides an excellent bridge between discussions of interpersonal relations and their actual handling. In addition, it presents test

situations to determine how well a trainee can handle various problems, and it makes the leader more sensitive to different methods and styles of leadership.

An illustration of role practice as a means of training foremen is presented below. Here the problem was to increase an inefficient factory operative's production; the quotation shows how three people attempted to handle it.

Foreman (*getting up reluctantly and going over to girl at the desk*). Well, Dottie, you only made 30 units yesterday. Did you have any special trouble? After I brought you all your work, too.

Girl. I didn't feel good.

Foreman. Did you have any machine trouble or anything?

Girl. Yes, I did.

Foreman. Well, why didn't you put your little red light on?

Girl. I don't know. I guess I forgot. And the thread breaks all the time.

Foreman. Well, you should tell me about those things so I can help you. You'll do that after this, won't you? And you'll try to do better too, won't you?

Girl. Yes, but I don't know if I can. It's hard to do.

Trainer. That's fine. Now let's talk about these two cases.[1]

The discussion continues with suggestions for using check studies and giving additional training. When the group is discussing "making excuses," the personnel manager, Mr. Jones, thinks that the supervisor should find out whether the girl has any personal problems. Because the trainer knows that this foreman has created resentment by prying into the personal affairs of her girls and because he wants to criticize the argumentative technique without criticizing her personally, he sets up a special situation.

Trainer. Let's see how Mr. Jones would tackle this problem. I'll be the girl, the same girl as the last time. (Sits at the "*machine*.")

Mr. Jones. Well, it just seems to me this way. There's lots of things that might be holding the girl back. Possibly she got a letter from her boy friend that had bad news in it, or something like that.

Trainer. Well, let's try it out and see how it works.

Mr. Jones (*getting up from his chair*). What did you say your name was?

Trainer. Dottie Sholley.

Mr. Jones (*now acting the role of supervisor*). I have some bad news for you here, Dottie. It seems you have fallen down a little in your units. What seems to be the trouble?

Trainer. Well, I didn't feel so good.

[1] From J. R. P. French, in S. D. Hoslett (ed.), *Human Factors in Management.* Copyright, 1946, Harper & Brothers.

Mr. Jones. But when you asked me to be your supply girl you seemed to be feeling well enough.

Trainer. Well, I got some machine trouble and that slows you up. And these old threads break all the time. You can't do much when that happens.

Mr. Jones (*pauses for a moment*). Did you go to the show last night?

Trainer. No.

Mr. Jones. Anyone in your family sick?

Trainer. No.

Mr. Jones. Did you have a date last night?

Trainer. No, I'm married.

Mr. Jones. And you say you haven't been feeling well?

Trainer. No, I wasn't feeling well, but that was yesterday.

Mr. Jones. You don't feel sick most of the time?

Trainer. No, that was just a little stomach trouble. There's nothing wrong with me.

Mr. Jones (*laughing*). You're sure bucking me. I give up!

Bill. If you let them get into an argument with you, you'll never get out. They answer and answer and answer.

Trainer. Thanks. I certainly was being a tough one. Now let me give you my reactions. When you came up saying you had bad news I felt nervous. I didn't like that, so I was sort of on the defensive. I was thinking, now what am I going to say? I thought of something, and then while I thought of that I thought of something else to have ready for the next question. Then he asked me about my family and that scared me. I thought maybe something was wrong. Then he asked me if I had had a date, and I was married. That made me so mad that I nearly slapped him. And when he asked me again about my health, I tried to assure him that I was in good health because I was afraid maybe he would fire me if he thought I was sick all the time. Now, this is the toughest kind of case you will get. A girl who doesn't do what she can do, and you just can't find out why. Now would you like me to try the skunk oil method?

Bill. Yeah, I think so.

Trainer. O.K. You be the girl, Bill.

Bill. Sure, I'll answer your questions.

Trainer. You try to be the same girl that Anne was and that I was. Be as tough as you want to.

Bill. O.K. (*Sits down at the table.*)

Trainer (*approaching Bill with the sheet in his hands*). Hello, Dottie. Here's the unit sheet for today. Let's see, where is your name? (*Turning the sheets with Bill's help.*) I guess it's over on another page. What have you been doing?

Bill. Well, I made 30.

Trainer. How does that compare with what you've been doing? Is that good for you or not so good?

Bill. Well, I have done better.

Trainer. How long have you been on the job?
Bill. About six weeks.
Trainer. Well, it usually takes a girl three or four months to make 60. You say you have done better?
Bill. Yes.
Trainer. Have any trouble yesterday?
Bill. Yes, the thread breaks all the time. And I had such little bundles. I had to get more all the time.
Trainer. Oh, I'm sorry. I told you yesterday I was going to bring you a lot.
Bill. But they're too little. You run through them in no time.
Trainer. What you want to do is not worry about your progress one day or another day. How much do you suppose you will make a week from today? Maybe you'll get some small bundles and maybe your machine will give you trouble, but counting that in, what do you suppose you will make in a week?
Bill. I don't know. I might make 40 or 45.
Trainer. You think you could make 40 or 45! Why I've known girls who have taken three or four weeks to get up there from 30! What's the best you have made?
Bill. I think it's 48.
Trainer. Well, maybe you could then. How'd you like to try and make 40 by next Friday?
Bill. You mean just do 40 by next Friday?
Trainer. Yes, that gives you a good chance in spite of machine trouble and those things that you can't help that come up. Do you think you could do it?
Bill. I believe so.
Trainer. Now I don't think you can do it if you have troubles that aren't your fault. Now on the matter of thread breaks, sometimes that's the way you hold your cloth and sometimes the trouble is with the machine. When you get trouble like that, we can call the mechanic in or we can get the trainer over to see what's wrong. You want to have perfect working conditions. I'll come over Friday to see if you have made it, and I'll come around every other day, too, to see if I can help in some way. (*End of role playing.*)
Mr. Jones. Fine!
Trainer. I don't think I did that very well, but I was trying to use a different technique. Now what's the difference?
Mr. Jones. Well, you weren't on the defensive all the time.
Trainer. You mean Bill didn't put me on the defensive?
Bill. What he means is when you were the operator you answered him back. And I could answer all your questions to me this time, but there never was any blame on me.[2]

A detailed discussion continues for fifteen minutes on how to avoid arguments, putting a person on the defensive, the use of production goals, why the trainer used the *lower* of the girl's two estimates as the goal, etc.

Tannenbaum, Kallejian, and Weschler (*30*) cite three limitations of

[2] *Ibid.*

conventional training programs: (1) the trainee is removed from the social setting in which he customarily performs; (2) imparting human relations information may have little or no effect in inducing changes in behavior; and (3) the carry-over from the training to the work situation may be negligible. To minimize these limitations they propose that a trainee group be vertically structured, i.e., include different levels of management, as in the work situation, and that the training emphasize the development of the trainee's sensitivity to himself, to others, and to the ways in which people interact. They regard the functions of the trainer as creating situations conducive to learning, by developing interpersonal skills in the group members.

The outstanding characteristic of companies that have training programs is the combination of many techniques. Planty (*26*) describes the program at Johnson & Johnson as including 15 aspects, namely:

1. Review of economic conditions.
2. Multiple management.
3. Role playing.
4. Case studies.
5. Specialized conferences.
6. Harvard advanced management course.
7. Wharton School of Finance.
8. Reading.
9. Conference leadership.
10. Public speaking.
11. In-plant conferences.
12. Psychiatric group study.
13. Out-of-plant conferences.
14. Short courses, seminars, school and college programs.
15. Counseling.

Van Ark describes the General Foods Corporation program as including: job rotation, understudying, outside courses, internal informal training, individual counseling, and staff meeting participaton (*31*).

Worthy (*32*), referring to the Sears, Roebuck & Co. program, recognizes that four things are basic to a successful development program: (1) there must be system and organization; (2) there must be two kinds of measurements, one focused on the man, the other on performance; (3) the program must be based on certain principles of morality and fair dealing; and (4) the program must have the whole-hearted understanding and support of top management. The Sears plan is comprehensive and includes the following five elements:

1. Analysis of organization needs.
2. Selection of persons who appear to have potentialities for advancement.
3. Preparation of training plans to aid in realization of such potentialities.
4. Periodic appraisal to evaluate individual progress.
5. An executive inventory control to help maintain the necessary balance between numbers and kinds of persons coming up the line.

Habbe (*18*) made a study of nine companies offering training programs for executive development. He summarizes the twenty techniques found in use as follows:

Almost always used:

1. Merit or performance reviews.
2. Visits to other companies.
3. Attendance at technical meetings and management conferences.
4. Distribution of reading lists and management bulletins.
5. Group meetings.

Often used:

6. Job rotation.
7. Advanced management courses at Harvard and elsewhere.
8. Consultants.
9. Committee assignments.
10. Executive inventories.
11. Job descriptions.

Sometimes used:

12. Special trainee positions.
13. Multiple management plans.
14. Management cabinets.
15. Understudy or assistant-to positions.
16. Community leadership.
17. Health and fitness programs.
18. Individual counseling.
19. Assignment to training or sales department.
20. Sponsor plan.

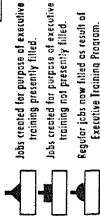
The additional value of this National Industrial Conference Board report is the inclusion of case studies of the following company programs:

1. Standard Oil Co. (New Jersey)
2. Lockheed Aircraft Corp.
3. Hardware Mutual Casualty Co.
4. McCormick & Co.
5. Sears, Roebuck and Co.
6. Bank of America
7. Swank, Inc.
8. Eastman Kodak Co.
9. Bigelow-Sanford Carpet Co.

The Standard Oil Company (New Jersey) initiated an executive development program in 1944. It has grown in importance with the years. Its basis is reducible to four rather simple principles, namely: (1) Know what the management structure of your company must be; (2) select candidates who have the qualifications required by the jobs; (3) establish a simple method of appraising the candidates selected; and (4) provide the training necessary to complete the candidate's experience (*28*). The best way to determine the management structure and estimate manpower needs is to study a chart such as the one in Figure 8.3.

A word of caution must be added to the listing of the "big" companies. Of course these companies can afford such programs is the rationalization offered by small companies, who sometimes are not so small. The fact is that small companies, i.e., 50 employees or more, may need training and development programs even more urgently. In a large company, a single executive may be "covered up," "kicked upstairs," or otherwise "swallowed." His mistakes may be neutralized by the bigness of the company with its counterchecks. The smaller company executive occupies a relatively more important role in his company. Smaller companies often are strong but have no reserves. Possibly a crude analogy from football may be drawn. Two teams may have equally good first teams, but their reserves often determine which one wins. The smaller company must be concerned with its reserves, especially when they are nonexistent. No company, big or small, can expect to continue without potential replacements.

An additional caution, but along very different lines, comes from a research by Fleishman (*15*) evaluating a leadership training course for foremen. The usual procedure is to evaluate pre and post training, that is, measures before and after the training course. These measures are intended to indicate the effects of the program. Fleishman went one step further and evaluated the training back in the actual work situation. He found that the training did not produce any kind of permanent change in either attitudes or behavior. The "back home" leadership climate is an important variable related to the behavior and attitudes of foremen in the work situation. This would mean that leadership training cannot be considered in isolation from the social environment in which the foremen must function. Changes in foremen, as a result of this training, may be difficult if the work situation remains constant. In other words, certain aspects of the foreman's environment may have to be recognized if the training is to be effective in modifying his behavior.

*Figure 8.3.* This Chart Shows How Jobs May Be Created for Training Purposes.

Training may be effective if the work environment tolerates the hanges; if not, the person may be unable to use what he has learned. Ie may even be frustrated by not being able to do anything and as a esult be unhappy with his training and the plant conditions, because he ras trained.

### Summary

The problem facing all levels of leadership is basically the same—how ɔ deal with and lead people. Different types of leadership—autocratic, ıissez-faire, and democratic—resemble political atmospheres. Leader- ıip is not a one-way proposition; it involves a subordinate-superior re- ıtionship. The subordinate is dependent upon the superior for security. Conditions which produce security in the subordinate also encourage in- ependence in him. Research indicates that leadership characteristics can etter be regarded as behavioral, situational, and the interaction of the eader and the group rather than as "inherent" traits residing solely in an ıdividual.

The leader need not be arbitrary or dictatorial; such a person does not btain maximum respect from the group. The rules of supervision center round treating all members of the group fairly. The leader should set up n effective system of communication.

This point of view leads to the importance of training people to be eaders. Many systems are used and no one is absolutely better than many thers.

Role playing is a valuable method of training leaders in interpersonal elations. Ways to make training more effective have been discussed in ıis chapter.

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# CHAPTER 9.

## • Industrial Warfare

THE extent of industrial conflict and warfare concerns people in all walks of life. It has been crystallized by the clash of the interests and desires of various groups. Even though some people claim that the interests of employers and employees are basically the same and that there is no need for conflict, the extent of the conflict indicates either that this claim is not justified or that many employees and employers do not regard it as valid.

The complexity of our industry has increased to such an extent that people are faced with a very real problem in finding a way to live. The technological advances in science and industry have been vast; it almost seems as if an inverse relationship exists between them and the advances in human relations. It is imperative that the latter catch up with the technological advances. Industrial psychology can help to achieve this objective. It applies to everyone in industry, employer and employee alike, and also to the organizations and groups these individuals form.

One reason for industrial strife in this country is the contest between management and organized labor for prestige in the eyes of the workers. Some employers believe that their employees need not join a union in order to get a square deal and for this reason they resist such activity when it occurs. This type of employer often regards unionization on the part of his employees as an act of desertion. He believes that unions foment trouble and drive a wedge between the company and its employees. Some unions, on the other hand, regard any attempts by management to improve employee welfare as an attempt to weaken the union or to prevent unionization. They believe that only through union action can the true interests of the worker be served.

The controversy concerning the closed shop is a good illustration of two different ways of looking at the same thing. The employer regards

the closed shop as a violation of individual rights. He insists that the individual employee is not free to make up his mind about joining a union; he *has* to join. The union, on the other hand, believes that the closed shop is necessary if the union is to continue in existence and that all employees should contribute equally to it because they all benefit equally. Each side insists that the other maintains an intolerable position.

Even employee discipline is a cause for conflict. The employer in the past considered that this was his prerogative. The union, in its anxiety to protect its members, insists that discipline must not be unilateral, but that it, as the representative of the employees, should be consulted. To argue whether or not this is an infringement of the rights of management will not solve the basic difference. In other words, in the present stage of our industrial culture, individuals belong to groups, and these groups frequently believe that they have conflicting interests. This is the basis of our present-day industrial warfare.

### Why Do People Organize?

In our society, people are gregarious. This means that people *learn* to form groups. They learn that they as individuals gain economic, psychological, and social benefits through forming groups. It must be remembered that the interplay of these three forces is so great that it is exceedingly difficult to separate the economic from the social and these in turn from the psychological. People join the same group for a variety of different reasons. Whereas one person may join primarily for economic reasons, another may join primarily for psychological reasons, and still another for social reasons. As a rule, an individual does not differentiate among the three, and the ultimate reason he gives is usually nothing more than a rationalization.

For example, one political party may stand for a high tariff and another for a low tariff; some people will select their party on the basis of whether its tariff policy serves their economic interests. However, belonging to a political party has a psychological and social meaning to many people. Some may be active in their local political group primarily for social reasons—they like to play cards and there is an opportunity to do so when no campaign is under way. Others may belong to a political club primarily for psychological reasons. Being a member of the group offers an opportunity for self-expression. If one is the captain of the district, this often gives him much-needed prestige; he gains status in the community as an important local politician.

If we turn from the political club to the country club, where the emphasis is on social activities, we find the same interplay of these three forces. For some individuals, belonging to a country club may have real economic significance, for in addition to meeting the right kind of people they make many business contacts and close many transactions in its favorable atmosphere. The social reasons for joining a country club are obvious—one is accepted in the group he wants to join. Of course the individual psychological gratifications also play an important role.

Organizations run through our entire society; the family, the religious order, the political party, the manufacturer's association, and the union are all examples. People join any number of groups for many different reasons. Once the group is formed, it soon finds that direct appeals to individuals bring the greatest gain in membership. The union promises prospective members security, independence, and economic gain. The country club offers its prospective members desirable friends, favorable environment, and entertainment facilities. The trade association promises business information and group protection.

It is important to remember that a group can be no more than the sum total of the individuals in it; often it is much less. In other words, it is often run by a few people, and most of its members are quite content to have it this way. The group therefore takes on the character or personality of the few most active members. The possibility that some of them may not be qualified for leadership is obvious. Nevertheless, they gain control, sometimes by political maneuvers, sometimes by showing greater willingness to work than others in the group, sometimes by force, but most often through the acquiescence of the other members. As the group develops its so-called "character" or "platform" it becomes a matter of rote rather than reason.

An industrial organization can be considered a group, just like any other group. This applies to a factory and to an association of manufacturers, employers, or employees, formal or informal.

A factor which should be recognized in any group is the function of status. Chester I. Barnard (*1*) has made some outstanding studies along these lines. According to him, all status systems result from the various needs, interests, and capacities of individuals. He lists five items in relation to the individual upon which these systems are based:

1. The differences in the abilities of individuals.
2. The differences in the difficulty of doing various kinds of work.

3. The differences in the importance of various kinds of work.
4. The desire for formal status as a social or organizational appeal.
5. The need to protect the integrity of the person.

Depending upon the needs of the individual, the importance of status and the character of the group are largely determined by the character of the group's leaders.

Organizations may be classified as authoritarian or democratic. One of the paradoxes of our society is our insistence upon political democracy and our neglect of industrial democracy. There is no doubt that democratic organizations serve the interests of the individual members to a greater extent than authoritarian organizations. The leader of the latter type assumes that he knows what is best for the members; he often feels contempt for them and believes them incapable of judging what is best for themselves. This type of leader drives hard to get things done; he regards immediate action, even if it requires force, as the outstanding measure of achievement. Authoritarian organizations tend to discourage individual initiative and impel the members to become dependent upon the benevolence or malevolence of the leader.

A democratic organization places more responsibility upon all the individual members, but the joys and satisfactions are distributed more evenly throughout the group. The following are some characteristics of democratic organizations:

1. They allow majority rule.
2. They permit free discussion.
3. They give equal importance to all members.
4. They do not make a fetish of status.
5. They do not frustrate individuals or subgroups.
6. They do not use power or force to gain objectives.

When an organization arrives at a decision as the result of the rule of the majority, providing that the majority is not dedicated to the persecution of the minority, we have the outstanding example of democratic organization. In order to reach this majority rule, it is important that ample and free discussion be held. The introduction of various rules of parliamentary procedure, especially in small organizations, often encumbers truly democratic action. The chairman of a meeting should see that the group has ample opportunity to discuss every aspect of all problems.

As Barnard says, status levels develop in any organization. However, it

is important that all the members be regarded as having equal rights. Each member, regardless of his status, must be considered a free individual. A democratic organization should regard status as a temporary grant. An outstanding characteristic of authoritarian organizations is their tendency to adopt status symbols; uniforms, shirts, insignia, and other trivia are used to cover up their inadequacies. People who cannot gain importance in any other way or who are frustrated often take pride in the fact that they can wear a brown shirt or a white sheet; it is their only mark of distinction. Individuals who accept the "mark" give up their freedom and rights; they respond to forces from above and persecute blindly anyone they are told to oppose.

Majority rule, on the other hand, consciously attempts to avoid frustrating individuals or subgroups who do not conform with the majority. The fact that these people have different views is recognized, as well as their right to express their views. Sometimes, of course, the minority tries to obstruct the activities of the majority, but such tactics cannot be regarded as democratic. This situation, although difficult, can be handled in a democratic fashion.

An organization or its leaders sometimes become drunk with power and demonstrate this power by the arbitrary use of force. If we ever reach the height of civilization that most of us strive for, power and force will be recognized as unnecessary evils. No democratic organization, industrial or of any other type, should find it necessary to use its power or to exert force to control its members.

It is imperative that every member of any organization, regardless of its type, strive for its democratization. However, many people are so firmly enmeshed in authoritarian rule at the present time that progress is very slow. A dictator, whether he is a captain of industry or a labor czar, cannot be expected to yield power willingly. No organization that is not democratic, whether it is one of employees or employers, can serve the best interests of the people who belong to it.

### Employee Organizations

It is characteristic of our society for people with common interests and desires to form groups, and employees do just that. The groups formed by employees are both informal and formal in organization. Examples of informal organizations are the cliques which exist in the various departments of a company or in a union. An example of a formal organization is the labor union.

Unions, like any other organization, are formed because of economic, psychological, and social reasons. Some employees consider that they are at a disadvantage in bargaining with their employer. While they believe that one employee is as much an individual as one employer, they do not believe that one employee has as much power as one employer. Hence they group together in an effort to equalize the power. This often results in the employer's believing that he is at a disadvantage in bargaining with a group of employees, so he joins a group of other employers. Thus two opposing groups are formed and the conflicts between them are what we call industrial strife. Some employees believe that joining a union will give them a better opportunity to maintain the welfare of their respective families; they claim that hiring and firing should not rest solely in the hands of an individual employer. Others, on the other hand, believe that everyone must take his chances; they prefer to be free to work or not as they see fit.

Some employees also believe that membership in a union gives them an opportunity to develop more self-respect. The importance of this need must not be underestimated. Golden and Ruttenberg (*10*) in their admittedly biased but nevertheless dynamic book give many illustrations of this need. Their story of "Big Mike" is particularly pointed. "Big Mike" worked in the Pennsylvania Railroad Yard in Pittsburgh during the First World War. Workers, not jobs, were scarce then. In his twelve years with the road, he had never asked for a personal pass which permitted employees to ride free of charge. One day "Big Mike" decided to get a pass to visit some friends in Philadelphia. Dressed in his working clothes, he went to see his boss at noon. He broke into a conference in his boss's office and brusquely demanded a pass. The boss bawled him out vigorously, ordered him to get into clean clothes and come back in an hour and make his request properly. An hour later "Big Mike" quietly entered the outer room of the office, waited politely until the boss was available, and then presented himself in a gentlemanly fashion. "I'm back," he began in a low voice.

"Now, that's better," the boss said quickly. "You've come to get your pass to ride the road?"

"No, Mr. Roberts," said "Big Mike" calmly, "I've just come back to tell you to go to hell because I got a job on the B & O!"

"Telling the boss off" is often a compelling desire, and a person sometimes avails himself of an opportunity to do so when he believes that he has a group, such as a union, "in back of" him. This explains why striking

workers often consider a slight raise in wages a victory despite the fact that the strike has put them and their families in debt—at least they had the satisfaction of seeing that the boss had to give in.

A rather different view as to why workers join unions is offered by Temple Burling (2). He suggests that industrial workers, like everyone else, have a great deal of immaturity in their make-up. They have an inner eagerness to find parent substitutes. The boss, particularly the "Big Boss," is one of the convenient and obvious outlets for this emotional need. Unions were developed, according to Burling, as an economic weapon to fight other economic forces, but they have had another very important effect. They have given the working man a new relationship to satisfy his emotional needs so that he no longer needs a paternalistic employer. In other words, unions tend to take the place of the disinterested employer who serves as the economic father of the employee.

Many employers are surprised that their employees do not appreciate the various recreation facilities and special services provided for them. They regard this as an obvious sign of ingratitude and become soured toward employees as a whole. The trouble is that these employers do not understand that employees, as a rule, do not want to be babied and pampered and that they would appreciate these facilities if they had been allowed to take part in the decision to introduce them. The worker frequently questions the employer's paternalism and resents being treated like a child. The union thus serves a dual purpose so far as the individual employee is concerned. In the first place it becomes a more satisfying father-substitute than the employer, and in the second place it enables the worker to feel that he is accepted as an adult to a greater extent than a paternalistic employer sometimes considers necessary.

In discussing the impressionistic method of measuring attitude, reference was made to the Hershey Chocolate Corporation. We mention it again here to emphasize the fact that paternalism as such is neither good nor bad but depends upon the needs of the employees and the way in which it is expressed.

The most immediate concern of the union should not be overlooked in searching for reasons why unions are formed. The most important function of the union is promoting collective bargaining. The individual employee's belief that he can bargain more successfully when he is represented by a group is a result of psychological, economic, and social factors.

### History and Characteristics of Labor Organizations

For the rank-and-file worker, the process of unionization is a practical solution to the problems of an industrial environment. Union development in this country has never followed a master plan but rather has been characterized by trial and error. It has usually been opposed by those who believe in laissez faire. Unions have been interpreted as opposed to the doctrines of free enterprise and free competition and as violating the right to freedom of individual contract. Laissez-faire believers also advocate noninterference by government; they oppose (or have opposed) minimum wage laws, child labor laws, compulsory accident compensation, and other labor legislation as interfering with the freedom of contract of individuals. It is for these reasons that unions have been considered un-American. The unions, on the other hand, have never admitted the "inherent right of individuals" in such matters; they have always maintained that freedom for an individual worker demands that he operate in a collective and coöperative manner. They consider standardization of employment contracts as a necessity and in no way un-American.

The present problems of labor and management have their roots in the origin of the wage-earning class, which has a history of at least 150 years. To understand the labor movement in the United States it is necessary to realize that it stemmed from the industrial revolution in England. The far-reaching changes in economic, political, and social life starting about 1785 as a result of the invention of power machinery and its counterpart, the factory system, created misery among the working class. As their environment became more oppressive, workers were forced to organize. The early laws of England prevented this, but the repeal of the Combination Acts in 1825 led to the growth of unions.

In the United States the union problem was not as serious because of the lack of industrialization and the abundance of free land. The popularity of laissez faire also played a role in limiting unions. Organization, when it did appear, took the form of local craft unions and was limited to a specific trade in a specific locality.

The earliest known labor strike in the United States occurred in 1786, when the Philadelphia printers, though not formally organized as a trade union, went on strike for a minimum weekly wage of $6. By 1825, hatters, tailors, weavers, cabinetmakers, and a few others had formed unions in

their respective trades. The members were skilled workers and the unions had the characteristics of benevolent societies with their sick and funeral benefits. Unionization on a wider scale did not occur until the Civil War period. By 1870 there were 32 national unions.

Unions have had consistent ups and down with periods of economic prosperity and depression. Two unions that survived the panic of 1873 and became important in labor history were the Noble Order of the Knights of Labor and the International Cigar Makers' Union, the latter the forerunner of the American Federation of Labor.

The Knights were idealistic and concerned with the union of all workers; they believed that all wage earners were concerned with each others' welfare. At first the Order was a secret society with elaborate rituals, but in 1881 the membership was opened to practically everyone regardless of craft, skill, creed, sex, or color. Members of many professions and even employers were permitted to join. The few who were barred were bankers, lawyers, stockholders, gamblers, and those making or selling intoxicating beverages. This group increased its membership very rapidly. In 1885 it had 104,000 members and one year later the figure was 702,000. This rapid rise may have contributed to its downfall. In any event, a series of unsuccessful strikes resulted in a decrease in membership; by 1890 it had only 100,000 members and was disintegrating at a rapid pace. Reviewing the Knights' program, one is inclined to conclude that its centralized structure and its highly idealistic program were the primary causes of its failure.

Opposed to the Knights was the American Federation of Labor, founded in 1886. This was a loosely organized craft-union movement in which autonomy of membership was maintained. It was based upon the idea that wage earners are primarily interested in working for immediate economic advantages. It assumed that the craft was the most satisfactory unit because the interests of workers were most closely bound up with those of others in the same craft. The basic issue between the Knights and the AFL was whether the labor movement was to be idealistic or opportunistic. The AFL, which advocated opportunism, won. By 1920 this organization had four million members, but a period of relative stagnation then set in.

The advent of the New Deal and the National Industrial Recovery Act presented an opportunity for unionizing the citadels of the open shop—the automobile, steel, and rubber industries—by restraining the employers' antiunionism. The National Labor Relations Act further pro-

tected collective bargaining. However, the AFL with its craft orientation was not geared for such developments. In 1935, eight of its unions formed the Committee for Industrial Organization (CIO) within the AFL. These unions represented over one million workers, or approximately one-third the total AFL membership. The controversy as to whether unionization was to proceed along craft or industrial lines became so intense that in 1938 the CIO broke its affiliation with the AFL and became the Congress of Industrial Organizations. The unionizing vigor of the CIO coupled with its different ideas on who was to belong to what union led to a civil war in labor.

### Conflict Within the Ranks of Labor

The conflict between the CIO and the AFL was deep. The obvious issue between the two is craft vs. industrial unionism. To begin with, the AFL believed that the craft unions were the only ones likely to have a sufficiently strong common core to insure a permanent organization. The heads of the eight unions that originally formed the Committee for Industrial Organization wanted to launch strong organizing drives in nonunion and mass-production industries in the belief that specialized and unskilled workers could be organized into a permanent union. In addition, these men were dissatisfied with what they considered the structural and functional inadequacy of the AFL and its alleged incompetent leadership. Those who favor industrial unions insist that craft unions cannot organize the large industrial corporations and that the only effective means to this end is an equally large-scale industrial union. They maintain that the interests and needs of the workers throughout an entire industry are similar.

In line with its traditional view that dual unionism is intolerable, the AFL originally regarded the CIO as an upstart and a rebel to be dealt with sharply. But as the CIO program for unionization unfolded and proved to be successful, the AFL has tended to veer from its original advocacy of craftism. The CIO in turn has found that in many situations vertical unionism is not always the answer and some of its large unions have cut across industrial lines.

The weakening of their original position only served to intensify the split between the two unions. The presence of rival unions in the same and overlapping fields presented new and more difficult problems in the way of unification. In addition, the difference in their attitude toward politics must also be considered. The CIO has promoted political activity,

whereas the AFL has not been too happy about government activity in the labor field. Although the CIO is not a Communist organization, the AFL has frequently made such charges, especially against some left-wingers on the CIO general executive board. In turn the CIO accuses the AFL of harboring and encouraging labor racketeers and autocratic leaders.

The leadership in these two groups takes a different character. The AFL is controlled by older men who have spent many years in the upper labor circles. As individuals they belong to either the Republican or the Democratic party and will not allow the Federation to affiliate with either party. As men they are somewhat conservative and in some instances do not see the necessity for real activity on the part of their members. Some have become entrenched in autocratic one-man control. The CIO on the other hand is a younger organization. Many of its leaders are younger and not as staid. They are interested in education and member activity. They are active politically and are likely to be more liberal than conservative.

The competition between these two giant labor organizations has led to some jurisdictional disputes but not nearly as many as might be expected. For example, jurisdictional and rival union strikes in the United States in 1940 and 1941 amounted to 6.3 percent of the total strikes. This figure dropped to 4.1 percent for 1953 (*20, 22*). It may well be that such figures reflect the recognition on the part of labor that it cannot accomplish much by fighting itself.

Both organizations have rather similar structures and both have an opportunistic rather than idealistic approach. Both are business unions.

But these unions, over the years, have learned to live with each other. They started to pay more attention to their own growth possibilities rather than to attack each other. While individual leaders in each group have not exactly always demonstrated brotherly love, they have indicated the practicality of coexistence. By 1955, the two groups were able seriously to plan the operations involved in a merger.

### The Role of the Government

Labor-management relations have always involved the government as a third party. Both in England and in the United States, laws pertaining to labor have had a definite influence on the growth, trials, and tribulations of labor and, in turn, on management's behavior toward labor.

It is important to remember that government cannot be treated as an abstraction. Its role in labor controversies is determined by the people

who make up the government. The elected officials usually reflect the attitudes and beliefs of the economic and social class dominant at the particular time, because they come essentially from this class. It is also true that they most often represent the influence and power of the controlling group or class.

The New Deal served as a tremendous impetus to the growth of labor because its laws were favorable to labor. But the Labor-Management Relations Act of 1947 (Taft-Hartley Act) swung the pendulum in the other direction. It altered many provisions of the National Labor Relations Act of 1935 (Wagner Act). Two of the more important changes concern outlawing the closed shop and permitting unions to be charged with and found guilty of unfair labor practices. The Taft-Hartley Act has increased the rights of employers and narrowed their liabilities. For example, under it employers have no obligation to recognize or bargain with supervisors' unions, and employers have the right to sue unions for damages resulting from violations of collective contracts. This law is the most detailed, complex, and comprehensive national labor legislation ever to be enacted in the history of the United States. According to its proponents, it is designed to establish a power balance between employers and unions. According to its opponents, it is a "slave-labor act."

The point is that the law of the land at a particular time is not a reflection of any person's "inherent rights"; it is merely a reflection of the lawmakers' attitudes. In working for the passage or defeat of laws, organized labor and organized management may or may not indulge in politics. This is determined by organizational policy or the laws that the government passes.

As was true of the controversies in the past, those of the present and future will often find labor and management seeking the particular opportunistic advantage of the moment. Through public opinion or directly through government one group will exert pressure to have laws passed which best serve its partisan interests. At the same time the group that has little influence in government circles will insist that government must not interfere.

## Employer Organizations

Employers form groups just as employees do. In fact, there are over 2000 employer associations in the United States concerned in one way or another with labor matters (5). They even picket, as is shown in Figure 9.1. The history of employer associations is about as old as the history of

unions, for one of the earliest associations to appear was the Society of Master Cordwainers, which was formed in Philadelphia in 1789. Employer associations gained real prominence after the Civil War; the General Managers Association formed by 24 railroads to fight strikes exemplifies the belligerent type of organization that emerged. The National Association of Manufacturers was formed in 1895 and adopted actively belligerent policies in 1902.

*Figure 9.1.* Bosses Sometimes Picket, Too. (United Press Photo.)

Whereas some employer associations have been concerned with problems other than labor and some have been conciliatory toward labor groups, many have been directly involved in labor-management controversies.

It is claimed that the growth of unions has been such that the balance of power has shifted from employer to employee; hence, in order to equalize the various factors, management organizations have taken the place of the individual owners of business. For example, Henry Van Hoevenberg, assistant president of the Distributors Association of San

Francisco, gave the following reason for the formation of his employers' association (*16*):

> We want to deal with the unions on a basis of equality, not of submitting to collective force, and our experience in the past has shown us that the individual employer is helpless when opposed by the collective strength of a well-organized union covering the entire industry. This is especially true when that union, as in this case, has interlocking arrangements with other unions. Then it can exert economic pressure which no individual employer can resist.

Whether employer organizations are formed to combat the power of unions or unions are formed to combat the power of employers and their organizations is essentially unimportant. The fact that each is trying to fight the other sharpens industrial warfare.

The employer who promotes militant employer associations often insists that a harmony of interests exists in our industrial society. When a group opposes the employers it therefore opposes the interests of society and consequently should be restrained. He believes that he has a right to run his business free from the interference of outsiders. According to him, union organizers are disrupters of harmony and meddlers in internal affairs.

### Controversial Labor and Management Practices

To some employees and employers, unions have a number of disadvantages. In some cases an entire community may consider that unions are undesirable. To some employers, the practice of "featherbedding"—the union's insistence upon the hiring of more people than are needed to do the job—is wasteful economy. Some employers believe that in many instances unions oppose technological change, and they cite Petrillo as the outstanding example of such tactics.

Some workers maintain that there are disadvantages to unions because their right to bargain as individuals is interfered with, and their hours of work are controlled; but to other workers these disadvantages are advantages. Both employers and employees recognize that unions have increased the standard of living, and many employers are grateful to the unions for their aid in handling difficult personnel and disciplinary problems.

When a clash occurs between a union and management, the community as a whole is often innocently involved. A strike or a slowdown on the New York subways affects millions of workers to a considerable degree, for it interferes with their means of earning a livelihood. However, a

strike in a specific manufacturing plant is not likely to have such immediate and disastrous effects on the community.

Some union practices are a cause for concern on the part of serious students of harmonious labor relations, for they do not benefit the labor movement in the least. For example, the union business agent who has acquired dictatorial powers and uses them in an arbitrary and unwise manner brings criticism on the whole labor movement. The "quickie" or unauthorized work stoppage and the "slowdown," a slightly different variation, are both questionable. Neither is conducive to union-management coöperation and both often do the union more harm than good. Ca'canny, or the restriction of production by the union, is also a questionable practice. Reputable union leaders are not in favor of it and attempt to discourage it. Those who are opposed to unions cite such practices as illustrations of the inability of union leaders to control their members. When picketing is "militant," it often results in bloodshed, injuries, and death, and innocent people are frequently involved.

Questionable labor practices, however, are neither more nor less reprehensible than some management practices. The misapplication of time and motion studies, the degrading treatment of employees, the promotion of waste, the prevalence of the stretch-out, the hiring of private police or thugs, the converting of factories into arsenals, and the arming of vigilantes are a few of the questionable and controversial practices that have sometimes been indulged in by management in the past. It is exceedingly difficult to judge which group has been more guilty of controvertible practices. However, as both groups grow more mature and recognize that each has a permanent stake in our culture, such practices should disappear.

As for the leadership of unions, the accusation that many labor leaders are unfit for their positions has been made many times. Without prejudice it can be admitted that there is ample room for improvement. What is more, most of the important men in the labor movement have acknowledged this at one time or another. However, it must be remembered that the type of labor leader that emerges is frequently the result of the attitude of management. When a union must fight for its existence, it is only natural that the pugnacious leader will come forth; but as the union develops and grows, this type of leader will prove to be out of place and will be removed. Cooke, a consulting engineer, and Murray, the labor leader, collaborated on a worth-while book called *Organized Labor and Production* (4) in which this view is expressed:

If management has stoutly resisted the collective bargaining efforts of its employees, if it has discriminated against union members, and forced all but the boldest to crouch in the background, then it is likely to be rewarded by a set of officers and a committee noted best for their fighting qualities, and only secondarily for their administrative ability. On the other hand, if management has not opposed organizational activity and thus permitted the calmer and less spectacular leaders to come to the fore, it will be rewarded by a set of officers and committee which have no sores to heal and no background of antagonism to management. Under such conditions the transition for management from arbitrary control and for men from docile submission, to joint responsibility and cooperation will be much easier and with a minimum of misunderstanding and suspicion. Little of permanent value can be accomplished if labor must be constantly on guard against attack.

### Warfare

To understand the basis of industrial conflict, we must recognize the importance of the power drive. Although strikes are attributed to such specific items as wages, hours of work, working conditions, union recognition, or dismissal, we must realize that underlying all of these is a common factor, power or authority—who shall wield it and for what purpose. Everyone agrees that strikes are costly to employer and employee and, in some instances, to the community as a whole. A strike that becomes a knock-down, drag-out dogfight reaches such heights of intensity that not only do both sides suffer financial loss but the costs are often greater than the amount originally involved.

When industrial conflict breaks out, the employer resorts to costly means of winning. These costs are frequently greater than the cost of settling the strike would be. He often hires inefficient help and strikebreakers merely to show his strength. Similarly, the striking employees will go into debt, eat at soup kitchens, and make other financial sacrifices merely to show their strength.

During a strike, the worker may say he needs more money, and the employer may claim that he should be allowed to run his business as he sees fit. Or the worker may say that he must have the right to work under satisfactory and humane conditions, and the employer may argue that he must run his business with a reasonable profit. Money may be involved, but it may not be. Hence it is incorrect to assume that one or the other side is interested solely in getting more money in the form of profits or wages.

In any form of behavior, the manifestations of conflict are emotional. This applies especially to strikes. Reason, understanding, and intelligence

are relegated to the background. Once industrial warfare breaks out, many devious means are used to win it, and they are basically emotional. The main intent is to win at any cost and thereby demonstrate which side has the greater power. This applies to employer and employee alike.

Attempts to solve industrial conflicts are usually characterized by the use of force and power. The employer resorts to lockouts, police protection, labor espionage, black lists, and sometimes actual warfare. He also attempts to draw the community into the conflict by means of citizens' committees, loyal employee clubs, and propaganda.

Employee groups use the strike, the picket line, the boycott, and the slowdown, as well as violence and destruction, as their tools in this show of force.

To date, unions have not been adept in using propaganda to gain community support. For example, in a country-wide telephone strike, the company was very careful to inform the public "that *your* telephone company . . ."; in other words, the company tried to convince the public that it was theirs, and that therefore the strike was being waged against the people. The union, on the other hand, did little to convince the people that the inconvenience they were suffering was not the fault of the union.

Some of the more militant labor leaders apparently try to alienate the public even before a strike is called. In New York City a dispute concerning the management and personnel of the subway immediately affected the public through a slowdown.

With reference to involving the community in a strike, some novel and interesting approaches have been used by the labor movement in Japan, which had no traditions to worry about. Some of the so-called strikes which have occurred may be regarded as either annoying or amusing, depending upon the point of view. Sanshi Ishicuka organized a "production control strike" (*Time,* March 24, 1947). Instead of walking off the job, the union members set up a thirty-man committee divided into departments of production, sales, and electric power. Then they stepped up production and used the receipts to pay wages and buy materials. Ishicuka posted notices "To the Management: If you should come to the factory, please keep to the Board Room, and do not come to any factory building." Workers greeted violators in hushed, polite tones: "Will you kindly observe the rules of etiquette and refrain from entering these premises?" Eventually, the union gained everything it asked, and the executives got back a going business that had suffered no losses from

*Figure 9.2.* No Love Lost When Industrial Strife Breaks Out. *Top:* A worker shouts his disapproval. *Bottom:* Fighting it out. This is past the shouting stage. (United Press Photos.)

stoppages. This strike would, of course, be illegal in the United States, but it makes one wonder about the wisdom of this approach.

According to Mark Starr, who visited Japan at the request of General MacArthur, a streetcar strike was carried on as follows: The employees reported to work and maintained transportation schedules. The only thing they did not do was to collect fares. Instead, they made long speeches to the passengers to the effect that the company was unfair and that they were on strike. Starr says that this strike was settled in short order. A third illustration of the odd pattern of strikes in Japan concerns the telephone operators. They, too, went on strike, but remained at their switchboards. A person who made a call heard a long speech about the company's unfairness, but at the end of this talk the familiar "Number, please?" came over the wire.

Union development in the United States has been accompanied by bloody battles. Street fights, gas attacks, dynamiting, barricades, and other forms of warfare have taken a heavy toll of participants as well as nonparticipants. Property damage has always run high. The testimony before the National Labor Relations Board and in the earlier congressional committee hearings has been shocking. There must be a better way to solve these conflicts (see Fig. 9.2). And, if for no other reason than our pride in the thought that we are civilized, an amicable solution must be found.

## Solution

In the present stage of labor-management relations, collective bargaining seems to offer the best solution. If collective bargaining is to be sincere and mature, both parties must have relatively equal power; neither one must have so much as to force the other into submission. As contrasted with violence shown in Figure 9.2, we see the attempts to settle problems by more peaceful means in Figure 9.3. According to Harold J. Ruttenberg (*19*), the purpose of collective bargaining is threefold:

> One: To distribute the fruits of the business enterprise equitably among the employees through their labor organization in the form of increased employment, better working conditions, increased wages, and decreased hours; among the owners of the business, through their management in the conventional forms for rewarding investors; and among consumers, through better quality and lower prices.
>
> Two: To establish mechanisms which give employees through their labor organization the greatest feasible operating participation in the determination
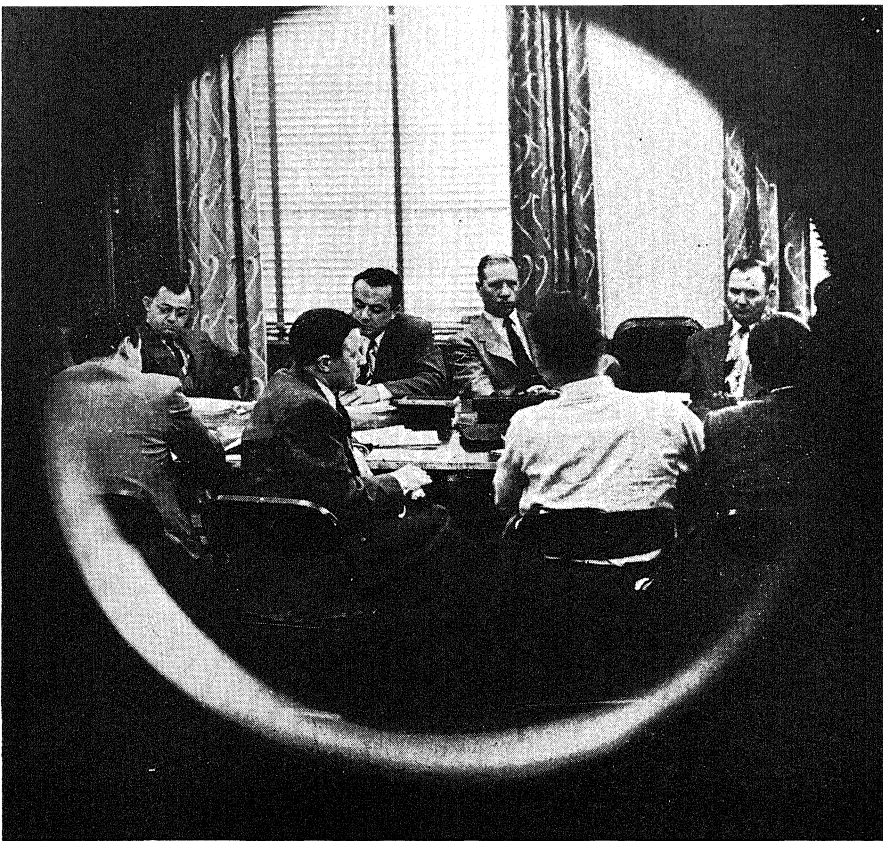
*Figure 9.3.* Peaceful Negotiations. *Top:* High-level talks as a way to avoid violence. (United Press Photo.) *Bottom:* A labor-management conference—serious but peaceful. (Courtesy of Standard Oil Co. [N.J.].)

of production procedures and administrative policies, designed to increase the output and distribution of goods and services.

Three: To provide employees and management with peaceful means to work out their mutual problems and changing relations.

In a survey based upon the responses of executives in 181 plants employing over 400,000 workers (3), management stated that four out of five labor-management committees have been genuinely successful. Seventy-nine percent of the respondents believed that the committees were helping to improve employee relations, and 55 percent believed that production had been increased. A labor-management committee is set up in an attempt to get the two groups to coöperate and thus head off the more formal type of labor-management collaboration in the form of collective bargaining between the union and management, with its constant threat of strike and reprisal. The solution to industrial warfare lies in the coöperation of the two groups and in honest attempts to iron out differences in a peaceful manner. Apparently many matters could be brought under joint control. Wages, hours of work, health, security, seniority, and employee grievances can be settled amicably, provided both groups are willing to meet on an equal basis without either attempting to use force.

Possibly a good means of preventing serious industrial strife is to recognize that grievances will arise and that machinery to handle them will lead to their settlement. What must be recognized is the attitude that exists toward grievances. If they are interpreted as a fight to the end, then grievances are unfortunate. If, on the other hand, they are interpreted as differences between the company and its employees regarding the meaning, interpretation, or application of the agreement, and are considered capable of being solved, they can be regarded as healthy manifestations of an industrial democracy.

A very simple pamphlet by Kaplan called *Making Grievance Procedures Work* (*12*) outlines the steps involved in grievance procedures as well as offering suggestions to make them work successfully. Although pamphlets can never settle the emotional problems, this one goes a long way toward establishing the view that handling grievances need not be emotional.

Lawshe and Guion (*13*) conducted a survey on attitudes toward grievances and conclude that a grievance must include imaginary wrongs beyond the mechanics of company vs. union relationships. They also find

that by analyzing grievances carefully, provisions for improvement in human relations can be made.

Porter (*18*) analyzed 197 arbitration awards and found that secondary motivations of status and group loyalty are of real significance in understanding the group procedure. Porter believes that further investigations of the motives and roles of the disputants as well as the arbitrator can lead to better understanding of the disciplinary and arbitration process.

Eckerman (*8*) in an analysis of the grievances and their makers of a large midwestern industrial plant found that most frequent grievances filed were for pay and wages, and that jobs and work was the second most common cause. These two items together amounted to 58 percent of all grievances. In his study he analyzed 766 separate grievances. He found that grievers had previously held more jobs and worked longer than nongrievers. Although the two groups were approximately equal in salary, grievers showed higher skill level than nongrievers. Grievers, as a group, went in more strongly for the group savings plan at the plant as well as credit union membership yet infrequently participated in the group hospitalization plan. Also, more grievers collected benefits for sickness and accidents as well as compensation for disability. Grievers, as a group, were in better physical condition and more grievers were married and had children. Eckerman wisely points out that his study simply indicates differences between the two groups and does not explain the reason for the differences. By comparing characteristics of grievers and nongrievers, a better understanding of the nature of grievances may be possible.

Weschler (*24*) attempted to study the personal factor in labor mediation. He found that a high percentage of "good" mediators scored within the "neutral" zone while all the "poor" mediators fell in either the pro-management or the pro-labor zone. He obtained these conclusions by using the "error-choice" method of attitude measurement described in Chapter 4. While it would be expected that the best mediator should be neutral it is well known that not all mediators are as neutral as they should be.

Osterberg (*17*) observed 11 union-management meetings and classified the participants' behavior as aggressive, negation, diffuse, a quest for information and clarification. He also had the participants estimate the success or failure of the meetings. The procedure in this instance is more important than the results. The suggestion that neutral observers, by

making a content analysis of behavioral differences in successful and unsuccessful meetings, can recommend desirable behavior is valuable. It would prevent such biased views as "the best way to negotiate is to needle" or other notions which may or may not be accurate.

Some rather strong vocal arguments have been raised concerning the divisive attitudes of workers as a result of the union attempts to have workers "hate the bosses." Recent work indicates that such things have not happened.

Stagner investigated the problem of whether workers could maintain a dual allegiance to company and union. He found that the majority of workers in five different establishments could and did perceive both company and union as groups which they could favor and support. Father Purcell in another study found 73 percent of a group of employees were favorable to both company and union and concludes that dual allegiance is not a strain for most workers. Kerr finds that mutual acceptance and coöperation between management and union tended to structure employees' satisfaction attitudes along integrated rather than divisive lines (7).

Golden and Ruttenberg have formulated 37 conclusions regarding union-management relations. Although collective bargaining would have to be introduced before some of the more controversial of these conclusions would be admitted, this program is nevertheless interesting. It presents in capsule form the thoughts of two men who have had considerable experience in labor-management relations on the side of labor.

SOME CONCLUSIONS REGARDING UNION-MANAGEMENT RELATIONS

1. Workers organize into labor unions not alone for economic motives but also for equally compelling psychological and social ones, so that they can participate in making the decisions that vitally affect them in their work and community life.
2. Collective bargaining marks the end of individual and the beginning of group relations between workers and management.
3. The initial collective-bargaining practices are influenced in varying degrees by the preunion history of the particular industrial concern and by the fact that genuine union-management relations are initiated by the union.
4. Collective bargaining is an instrument for workers and owners, through unions and management, to solve their problems directly without recourse to the government.
5. Collective bargaining is the extension of the basic principles and practices of democracy into industry.
6. The policies and actions of unions are likely to reflect the policies and actions of management.

7. The attitudes and actions of management largely determine the degree of co-operativeness of union leadership.
8. The time lag in the growth of constructive union leadership, after management ceases its opposition, varies with the extent to which labor assumes responsibility for the development of its leaders.
9. Salesmen and purchasing agents usually possess a more natural ability for handling management's relations with unions than do operating officials.
10. The leadership requirements and responsibilities of management increase under union-management relations.
11. Participation of workers, union representatives, and management at all levels is a prerequisite to the successful administration of a collective-bargaining contract.
12. The peaceful administration of a contract requires the confidence of workers that they will get justice through the collective-bargaining machinery in the settlement of their grievances.
13. Grievances should be settled speedily and as near their point of origin as possible.
14. Grievances should be settled on their merits with no logrolling permitted.
15. Management should frankly acknowledge the role of the union in bringing about improvements in working conditions.
16. The successful administration of a contract requires the maintenance of an effective system of communications for both management and the union, in bringing complaints from the bottom up and relaying decisions and policies from the top down.
17. The nature of union-management relations and the administration of a contract are influenced greatly by the pattern of social relationships in any given community.
18. Workers acquire a qualified property interest in their jobs under a collective-bargaining contract.
19. Each group of workers strives for the kind of seniority rules which it thinks will provide the greatest amount of job protection.
20. Seniority is an instrument designed to eliminate favoritism and discrimination.
21. The power to discharge should not be lodged in a single person.
22. Workers should enjoy full freedom of opportunity for advancement and promotion.
23. There is no basic conflict between seniority and productive efficiency.
24. A prime objective of collective bargaining is the redistribution of the proceeds of production.
25. Unions should participate with management in distributing the proceeds of each firm's production between its owners and workers.
26. The proceeds of technological changes, labor-saving machinery, and other factors contributing to lower unit costs of production should be shared equitably between owners and workers.
27. The adjustment of wage-rate inequalities should be exclusively on the basis of the merits of each case.

28. The greater the participation of workers through their unions in setting piecework and tonnage rates, in making time and motion studies, in determining work standards and job evaluations, the greater are the earnings and output.
29. Membership in the union should be a condition of employment.
30. The union shop is a necessary prerequisite for constructive union-management relations.
31. The union shop may be an instrument for either constructive or negative union-management relations, depending chiefly upon management's outlook and the caliber of union leadership.
32. Management's assumption of sole responsibility for productive efficiency actually prevents the attainment of maximum output.
33. The participation of organized workers in management provides an outlook for their creative desires, as it is essentially a creative and co-operative undertaking.
34. Union-management co-operation to reduce costs, eliminate wastes, increase productive efficiency, and improve quality represents a practical program that provides workers with effective direct participation in the creative phases of management.
35. Union-management co-operation tends to make management more efficient and unions more cost-conscious, thereby improving the competitive position of a business enterprise and increasing the earnings of both workers and owners.
36. The natural outgrowth of local-plant and individual-company collective bargaining is bargaining between district or industry-wide organizations of management and unions.
37. The future of industrial democracy depends upon the attainment of full production and employment on a sustained basis during and after the war.[1]

Eliel (9) as a result of experience in the field of industrial relations has attempted to gather a series of generalizations on which industrial peace depends. His major points are:

1. The atmosphere and surroundings in which collective bargaining is first undertaken are a powerful determinant of future relationships.

2. A collective bargaining agreement entered into directly between employers and employees meets with better acceptance than does an agreement written by an outside agency, such as an arbitration board.

3. Industrial conflicts that are climaxed by violence, whether on the part of the authorities toward workers or on the part of workers toward other workers or toward the property of employers, produce a reaction that is carried forward through the years and makes more difficult the establishment of normal relations.

4. The characteristics of an industry tend largely to determine the characteristics of its employees.

5. The nature of an industry tends to determine the sources from which

[1] From C. S. Golden and H. J. Ruttenberg, *The Dynamics of Industrial Democracy*. Copyright, 1942, Harper & Brothers.

management is recruited and the attitudes of management are conditioned by the industry to which it is attached.

6. Where collective bargaining is considered a mechanism for gradual betterment in the relations of the parties, improvement is almost certain to follow; where the approach is one of obtaining an expedient advantage, there is little likelihood of improvement in joint relations, and the chances are strongly in favor of their deterioration.

7. Where employers and union representatives hold irreconcilable differences in economic belief, where the union representatives have been thoroughly indoctrinated with left-wing philosophy and this philosophy is also the touchstone of union action, hope for enduring industrial peace is illusory, and conflict, whether open and obvious or concealed and furtive, pervades and dominates the employer-employee relationship.

A terminology has grown in connection with industrial labor conflict, and Warren and Bernstein (23) have very aptly defined certain terms in the various steps of the process.

"Conciliation" is the mildest form of intervention by a third party to bring about a settlement. "Mediation" tends to be a more affirmative procedure; the disputants, however, remain free to reject the process or the proposals. "Fact-finding" reflects its borderline status between mediation and arbitration. It rests on the assumption that full disclosure by an impartial agency will compel the disputants to agree. "Arbitration" allows a third party to settle the claims of each. The most exacting form of the settlement of the dispute is compulsory arbitration, and although both labor and management are against it because it seems that each one gives up its powers, some industries have used this system with considerable success and the minimum of interference in work due to strikes.

A tremendous step forward has been made by the National Planning Association with its series of key studies prepared on the causes of industrial peace under collective bargaining. Table 9.1 lists the companies, unions, and authors of the studies.

Each of the authors of the collection of case studies is a well-known authority in the field and most usually has a college affiliation. All have in common good and well-earned reputations. It is exceedingly unlikely that any one of them would be willing to weaken his reputation by inaccurate reporting. Because of this, each of the case studies is a worthwhile lesson in industrial peace.

In case study 14, which is a final report summarizing all of the previous studies, the environmental factors as well as the psychological factors contributing to industrial peace are described. See Table 9.2.

Table 9.1. National Planning Association Case Histories on Causes of Industrial Peace

| Company | Union | Prepared By |
|---|---|---|
| Crown Zellerbach | International Brotherhood of Pulp, Sulphite, and Paper Mill Workers | Clark Kerr and Roger Randall |
| Libbey-Owens-Ford Glass Co. | Federation of Glass, Ceramic and Silica Sand Workers of America | Frederick H. Harbison and King Carr |
| Dewey and Almy Chemical Co. | International Chemical Workers Union | Douglas McGregor and Joseph N. Scanlon |
| Hickey-Freeman Co. | Amalgamated Clothing Workers of America | Donald B. Strauss |
| Sharon Steel Corp. | United Steelworkers of America | J. Wade Miller, Jr. |
| Lockheed Aircraft | International Association of Machinists | Clark Kerr and George Halverson |
| Nashua Gummed & Coated Paper Co. | Seven AFL unions | Charles A. Myers and George P. Shultz |
| Marathon Corp. | Seven labor unions | R. W. Fleming and Edwin E. Witte |
| Minnequa Plant of Colorado Fuel and Iron Corp. | Two locals of United Steelworkers of America | George W. Zinke |
| Lapointe Machine Tool Co. | United Steelworkers of America | George P. Shultz and Robert P. Crisara |
| American Velvet Co. | Textile Workers Union of America | George S. Paul |
| Atlantic Steel Co. | United Steelworkers of America | Glenn W. Gilman and James W. Sweeney |
| Working Harmony in Eighteen Companies | Miscellaneous | Frederick H. Harbison and John R. Coleman |

With reference to the psychological factors, the most important ones influencing the quality of collective-bargaining relationships are certain broad attitudes and beliefs possessed by the parties.

With reference to management, four significant attitudes were found to have a profound effect on industrial peace:

1. The positive acceptance of the union and of collective bargaining.
2. The acceptance of the unions as a "political" organization.
3. The recognition of line of responsibility for personnel administration.
4. The management's attitudes toward workers as human beings.

The factors which were found to be important promotors of industrial peace on the part of the union leaders were:

Table 9.2. Factors Contributing to Industrial Peace

| Factors | Frequently Favorable Circumstances | Frequently Unfavorable Circumstances |
|---|---|---|
| *Industrial Environment* | | |
| 1. Size of plant and company | Medium-sized company | Industrial giant |
| 2. Production pattern | Steady | Seasonal; intermittent; production crises |
| 3. Technological advance | Moderate | Severe |
| 4. Nature of the jobs | Skilled; responsible | Assembly-line type |
| 5. Cost factors | Infra-marginal plant | Marginal plant |
| 6. Market factors | Expanding; cyclically insensitive; inelastic demand | Contracting; sensitive to cycle; elastic demand |
| 7. Locational factors | Relatively immobile plant | Relatively mobile plant |
| *Community Environment* | | |
| 1. The work force | Steady; tractable | Inconstant; combative |
| 2. The plant and the labor | Metropolitan area | One-industry town |
| 3. Local wage levels | Low-wage community and high-wage industry | Low-wage industry and high-wage community |
| 4. Industrial climate | "Union town" | "Open-shop town" |
| *Political Environment of the Parties* | | |
| 1. The union | Secure union; secure leaders; homogeneous membership; local autonomy; pattern-following | Insecure union; insecure leaders; heterogeneous membership; external domination; pattern-setting |
| 2. The employer | Pattern-following in employers' association; local autonomy in noncontractual matters | Pattern-setting; lone bargainer; strong central domination of local plant |
| *Time as an Environmental Factor* | | |
| | Origins in peaceful period; old relationship | Origins in warlike period; new relationship |

1. The union's recognition of management.
2. Understanding management's responsibility to the owners.

Certain attitudes were found to be held in common. These were related to mutual security and predictability, the satisfaction with the relationship existing, and a preference for intelligent compromise. It is most interesting that the biggest single item in connection with industrial peace, according to this survey, is related to attitudes. The technique that was most conducive to industrial peace was the one that attempted to solve specific problems rather than to advance rights and prerogatives. Joint committees were found to smoothly oil the grievance machinery. In negotiation of new agreements, those which were most successful had the

characteristic of negotiators on both sides having the authority to make decisions and commitments. In addition, prenegotiation in advance of normal conferences was found to be helpful, and peaceful negotiations were facilitated when both parties came to the conference armed with factual information. When the negotiators saw themselves as seasoned traders, rather than table pounders, progress was possible. The nine basic causes of industrial peace are listed by the National Planning Association:

1. There is full acceptance by management of the collective-bargaining process and of unionism as an institution. The company considers a strong union an asset to management.
2. The union fully accepts private ownership and operation of the industry; it recognizes that the welfare of its members depends upon the successful operation of the business.
3. The union is strong, responsible, and democratic.
4. The company stays out of the union's internal affairs; it does not seek to alienate the workers' allegiance to their union.
5. Mutual trust and confidence exist between the parties. There have been no serious ideological incompatibilities.
6. Neither party to bargaining has adopted a legalistic approach to the solution of problems in the relationship.
7. Negotiations are "problem-centered"—more time is spent on day-to-day problems than on defining abstract principles.
8. There is widespread union-management consultation and highly developed information-sharing.
9. Grievances are settled promptly, in the local plant whenever possible. There is flexibility and informality within the procedure.

It is to be emphasized that most of these causes are, to a large extent, determined by attitudes and so it may be that the promotion of industrial peace, as well as peace in general, can occur when the two parties to the dispute decide that fighting is useless and steps should be taken to work together.

Looking at industrial conflict from an impartial and long-range point of view, we may find that the trials and tribulations of the past few decades are a result of the growth of the labor movement, in part supported by federal laws. It would be pleasant to think of this upsurge as merely an adolescent attempt at self-expression. It may well be that this conflict stage has been necessary in the transition from power and force to democracy in industry.

If our political democracy is to survive, we must demonstrate its value in all walks of life. A further introduction of democracy in industry may

be achieved when labor and management regard themselves and each other as permanent structures in our society. As they learn to live together and trust each other, bullying, threats, force, and violence will become unnecessary. Mature coöperation will be achieved when they recognize the fact that, although each has different psychological, social, and economic reasons for existing, these reasons can be blended together and in the long run may not be incompatible.

A desperate need for research exists in the field of labor-management conflict as epitomized in disputes and strikes. Granted that employers want efficient production, low labor costs, loyal workers, and freedom from interference in management and that employees want secure jobs,
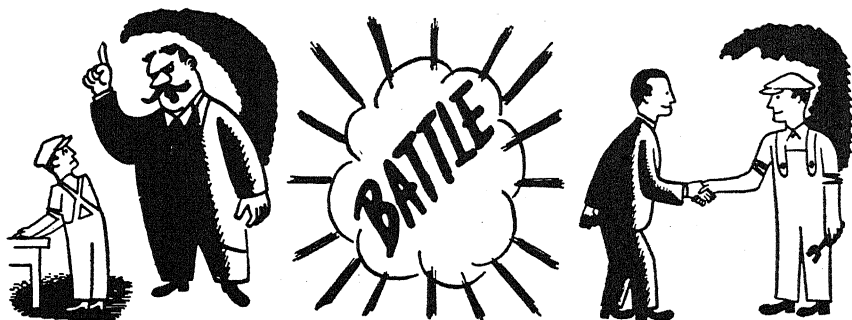
*Figure 9.4.* There Is a Better Way Than Violence. (Courtesy of Standard Oil Co. [N.J.].)

high wages, opportunity to get ahead, favorable working conditions, and the certainty of being treated as individuals with integrity. This means that such diverse group goals must often be in conflict. It should not mean that force and power will establish which set of goals is adhered to.

The legalistic approach may not ever solve the problem but the research approach may. Case histories, content analysis, surveys, experiments are techniques that can lead to hypotheses as well as testing them. Free, unfettered and unbiased research is needed.

**Summary**

Industrial conflict is crystallized in the clash of interests and desires of various groups. People in our society are gregarious and willingly form groups for many economic, social, or psychological reasons. Since this is true, it is to be expected that employees will form their own organizations.

The industrial structure of our society is complex, and so there are special reasons for the existence of unions. However, the patterns on which these groups are formed are similar to those which characterize the structure of any group. The use of force and counterforce by opposing groups has led to industrial warfare in which both sides contribute to destruction. The solution to the problem is not the abolition of one group, or one group's rise to power at the expense of the other, but for both in a mature fashion to bargain collectively on matters of joint control. As this takes place, more peaceful means will be found for settling the erstwhile conflicts, and we shall witness the introduction of even greater democracy in our industrial way of life.

Too little attention of the research-minded individual has been given to the problem of industrial conflict—or rather, stated more positively, to the causes of industrial peace. The research done in the area has been infinitesimal; much more is needed.

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# PART IV •

## • Problems Related to Work

WHEREAS Parts II and III are primarily related to satisfactions and interpersonal relations in work, Part IV is concerned with the concept of efficiency. It would be rather simple if it were possible to conclude that increasing satisfaction always increases efficiency and vice versa. Sometimes there is a cause-and-effect relation in the expected direction. However, sometimes the relation is unexpected and reversed. At still other times it appears as if no relation exists at all.

For this reason such topics as psychological tests, job analysis, the work environment, fatigue and other phenomena, as well as time and motion studies, training, and accidents, are treated as a unit ordinarily related to increasing efficiency. These concepts may also be related to increasing satisfaction, but exceptions must be specifically noted, and the generalization that satisfaction and efficiency always go together is impossible.

# CHAPTER 10

## Psychological Testing in Industry

PSYCHOLOGICAL tests presents an instance of one of the most common uses of psychological techniques in industry. In fact, industry has more or less accepted psychological testing as the function of the trained psychologist. Whereas many of the other problems such as incentives, training, and accident reduction are studied and attacked, in addition, by other specialists, testing is most often reserved for the psychologist.

As stated in Chapter 1, tests were used in industry prior to 1910 by Hugo Münsterberg in connection with various problems in his research for the Boston Elevated Railway Company. Since that time, testing in industry has been increasing. During the two world wars emphasis was placed on psychological tests and significant contributions were made; work in this field received a tremendous impetus during and immediately following these periods. Before discussion some of the specific programs employed by various companies, we must have a rather complete understanding of the nature of psychological tests, their advantages and disadvantages.

Psychological testing in industry should be approached with caution. Testing is often regarded as a fascinating subject by the novice. In many instances the desire to introduce a testing program is fostered in the hope that a solution will be obtained to a "no solution" problem. Most simply, testing in industry has the greatest opportunity for success when it is used to improve selection techniques. At the present time it is inadvisable that psychological test batteries be used alone in the selection of employees to the exclusion of the other techniques in the employment screening process. In other words, most tests can be considered only as aids to better selection. Even though tests are used, it is still advisable to conduct an interview, check the application blank information, and use the various other techniques recommended by good personnel procedure.

The expected result of improving the selection of applicants is that training costs and labor turnover are decreased, production may be increased, accidents and the probability of accidents will be reduced, and morale may be increased. However, the mere introduction of a good testing program cannot act like a magic wand to wave all these difficult problems away. Testing is no panacea. If used with moderation, testing in industry can be said to have value. An improvement in job performance of 10 to 20 percent is often all that can be expected. Although better results are sometimes obtained, this is the exception rather than the rule.

The point to be stressed is that psychological testing in industry is desirable and advantageous but should not be considered as the solution to all problems. For example, some years ago an employer in a certain factory was interested in introducing a testing program and consulted the writer. He complained of his high turnover, long training period, and many other difficult problems. He wanted to introduce a battery of psychological tests so that his selection of employees would be improved, in the hope that this would solve all his problems. A subsequent review of the type of work done in the factory indicated that psychological tests might be of value. In the discussions, it was found that the labor supply was rather limited. A high-school education, either general or academic, was considered a basic requirement for hiring. The question was raised as to why a high-school diploma was necessary, and why graduates of a general rather than a vocational high school were considered desirable. Probing revealed that the policy of the firm was to avoid union organization. In line with this policy, the factory never hired experienced people because they might be union members, and graduates of vocational high schools were not hired because it was believed that they were directly or indirectly connected with the unions. The point of view in this text is neither for nor against unions, and it is not the intention to introduce extraneous material during a presentation of psychological testing. This illustration serves to indicate that this employer wanted to use psychological tests primarily to avoid unionization and secondarily to improve the aptitudes of the applicants. This was called to his attention and he was advised to reconsider his so-called basic qualifications, since there was an available supply of experienced people. But he was adamant; he wanted the battery of tests to select the inexperienced people he considered hiring. The research results did not in any way solve the problem of the union attitude of the potential employee.

In many similar situations, a person does not know what to do either

because the problem he faces is too difficult or because there may be more than one correct solution to it. Similar situations arise in connection with hiring practices, and in such cases an employer may grasp at the idea of psychological testing as a drowning man supposedly grasps at a straw. If two applicants are available for a job paying $10,000 a year and both appear to be exceptionally good, the executive officer may prefer to "pass the buck" so that he cannot be blamed if the one employed does not prove to be the success predicted. At such a time he will believe that psychological testing, or even fortunetelling, might be good; for once the decision has been made, it is impossible to know whether the other applicant would have been any better. Hence a psychologist may be called in to give some tests and recommend hiring one of the two applicants. The extent of help a psychologist can give in such a predicament is limited. At best, he can only analyze and interpret the test results of the two candidates and point out any differences the tests reveal. He may not know—and in most instances does not care to guess—whether the tests are related to successful job performance.

### Greatest Testing Danger

The greatest danger in psychological testing at the present time is the possibility of its being oversold. Since the war, many psychological testing organizations have sprung up, and some have made all sorts of claims to potential clients. When these organizations employ professional psychologists, the likelihood of exaggerated claims is not too great; but when they employ people who are immature professionals or pseudo-psychologists, there may be trouble. Psychological testing is a good thing, but like all good things it may be overdone. If unscrupulous individuals who claim to be psychologists or even trained psychologists with advanced degrees fail to maintain rigidly high standards, the use of testing may be harmful. All claims must be based upon substantial data, and they must be examined. The profession would rather have psychological testing proceed slowly than have it suffer a serious setback because of exaggerated claims or inaccuracy. Precisely because of the rapid increase in the use of tests during the past few years, considerable caution must be exercised.

Before a business concern hires a psychologist or a professional organization to introduce a testing program, it should take the precaution of determining professional competence. As suggested in Chapter 1, the attainment of graduate degrees in psychology, membership in profes-

sional societies, and the relative extent of experience should serve as guideposts. It is often desirable, in addition, to have more than one individual or group bid for the services. The potential employer should then make a choice. The likelihood is that legitimate costs are related to the professional level of the staff and time spent. Further, the competent psychologist cannot guarantee absolute or positive results. All that he can do is refer to previous experience and indicate the possibilities and degree of success.

Potential users of psychological tests too often insist on absolute guarantees and when they cannot obtain them consider the spending of money too risky. This encourages those with less professional integrity to exaggerate claims or to concoct schemes whereby the employer gets his testing but does not pay for it.

For example, there is an organization which administers a battery of tests to college graduates who expect to enter "a certain business." It does so with the approval of the association formed by the employers in this business. Every candidate pays $15 to take the tests, and the testing organization reports to the business association and recommends whether the candidate be hired or not. Various abilities and aptitudes, including creative ability, are allegedly measured by these tests. Many psychologists who have worked in the testing field readily admit that the successful measurement of creative ability, especially in connection with a specific occupation, is not only difficult but questionable. Such claims should not be made until specific evidence can be offered to substantiate them. In this particular instance, no such evidence has been offered. Applicants for a position in this occupation are forced to pay $15 for tests if they wish to be hired. If it had already been established that the tests could differentiate between successful and unsuccessful candidates, this would not be unfair. But if, on the other hand, experimental research is being carried on, it is unfair to take advantage of the applicants by making them pay for it. Such a testing program is unfortunate. It may well be that this organization will actually develop a way to measure creative ability among other things. At the present time it cannot. It is making claims rather than presenting facts, and it is charging the wrong people for the research. Psychological test selection should depend not upon assumptions but upon the results of research. Candidates for positions should not be made to pay for this research.

In the profession of psychology and specifically in the use of psychological tests, secret formulas and secret techniques are unlikely. People

who claim to use them are either unprofessional or unethical and should be so considered until they offer evidence that proves their claims.

Some years ago in New York City, finger dexterity testing was the vogue. One of the department stores used such a test to select packers and within a short time many other stores followed suit. These other stores had no data but assumed that the first one knew what it was doing. Actually, this was not the case. The first store based its approval of the testing program on scanty research and an ambiguous report. Finger dexterity tests can be used with some success for certain purposes, but they have no value in the selection of packers (*4*). Blum and Candee obtained correlations of about zero between the test results and the production records of a group of department store packers and wrappers. In a follow-up study, the same authors found that speed and accuracy in clerical detail bore a closer relationship to employee production than finger dexterity (5).

It is necessary to have an understanding of the background of psychological testing before one can be expected to use such tests. Otherwise he is not in a position to know the difference between a psychological test and a mere series of questions.

### Characteristics of Psychological Tests

A psychological test is a sample of an aspect of an individual's behavior, performance, or attitude. It is assumed that the sample measured is sufficient to predict the most usual or typical functioning of the individual. In psychological testing a standardized series of questions or tasks is presented in a standardized manner. Psychological tests must have three attributes: *validity, reliability,* and *norms.* The extent of these three characteristics must be established and known before it can be claimed that the material assumes the proportions of a standardized psychological test. Throwing together a series of questions regardless of whether they concern psychological topics does not elevate them to the level of psychological testing. For example, many newspaper columns and popular books of the parlor-game variety present a series of questions; the person scores the answers and rates himself as "excellent," "good," "bad," or "awful." These are not psychological tests, they are merely batches of questions. Of course, an individual often has an overwhelming curiosity to find out something secretly and so the self-testing plan is very popular. The subjects of the tests usually have wide appeal. For example, a column may ask you to determine whether you are an outstanding husband, and

indicate that you can find out by answering a few questions. A person may have inscrutable wisdom, but the only way he can develop a test to measure such qualities is to have a series of questions that have been answered by successful husbands (whoever they are) and unsuccessful husbands.

The most important characteristic of psychological testing is *validity*. Validity means that the test actually measures what it purports to measure. There is only one way to determine the validity of a test and that is to compare the test result with performance on the job. A valid test that measures a specific ability must differentiate between the more able and the less able. If it does not do this, it is invalid and does not measure the ability in question. The same principle applies to any psychological test, and especially to tests used in industry. No one is justified in using a psychological test based upon a priori assumptions. A valid test in industry must differentiate between poor and good workers. Although it is sometimes exceedingly difficult to determine the successful workers on the job and the extent to which they are successful, this difficulty does not excuse avoiding the problem. A psychological test should never be considered in industry unless evidence is presented regarding the extent to which the test is valid. Tests must be developed and used experimentally in order to obtain a measure of their validity, but tests should never be used as a basis for employee selection unless their validity has been established.

The second characteristic of psychological testing is *reliability*. A reliable test yields similar results upon retesting. A test that gives a certain individual a high score at one time and a low score at another cannot be used for predicting usual performance and is therefore unreliable. It must be remembered that a psychological test is a measure of a sample of behavior so that the most typical performance can be predicted.

The reliability of a test is easier to establish than its validity. It may be obtained by giving the same test on two different occasions, by comparing the results with one-half of the test and the results with the other half, or by comparing the results when equivalent forms of the same test are used. The correlation coefficient must be +.90 to establish adequate test reliability.

Since it is much easier to obtain a reliability coefficient than to measure validity, it sometimes happens that the author of a test will report its reliability but fail to mention its validity. A test may be perfectly reliable

and still not offer any guarantee or indication as to its validity. Hence one should always be on guard to see that a test has both reliability and validity.

The third characteristic of a psychological test is that *norms* must be available on the test results. A norm is a standard of reference; it enables one to understand the meaning of a test score. Depending on the test, a raw score may be reported in various ways. Total time to complete the test, number of items correct, or number of items attempted are a few of the raw scores obtained on tests. Actually, by itself, the raw score on a psychological test is a meaningless figure. For example, on one test a score of 240 seconds may be poor, whereas on another test a score of 375 seconds may be exceptional. The problem is further complicated when a score of 180 seconds must be compared with a score of 95 items correct. Without the use of a norm, such comparisons would be impossible; at best, they would resemble an attempt to compare apples and peaches.

The two most widely used systems of norms are *percentiles* and *standard scores*. Both measures indirectly give information on the test performance of the individuals in a known population and also show the relative position of one person in the group as a whole. On a test to measure stenographic ability an individual's raw score might be 105 words per minute with one error in transcription. Unless we had information about the range of speed based on many people, we could not know whether this rate of speed was good or poor. However, if this test has been given to 155 gainfully employed stenographers and this individual's score placed her in the 90th percentile, we would be in a position to estimate her ability to take shorthand as "exceptional" because she exceeds 9 out of 10 girls in shorthand speed. If this same individual types at a speed of 45 words per minute and if this score is equivalent to the 20th percentile, we could conclude that 8 out of 10 employed stenographers are faster typists. Actually, shorthand speed and typing speed can be compared. On the basis of the norms available, we can make a direct comparison of this girl's performance on these two tests, and our conclusion, that she is very good in taking dictation but poor in typing, is justified. Whether she is hired depends on the needs of the job; it is most probable that she would have to improve her typing speed before job placement would be possible.

For some clerical jobs speed is of great importance, but in others ac-

curacy is more important. For example, for a job of addressing circulars, speed rather than accuracy might be sought. On the other hand, for filing important papers, extreme accuracy would be necessary. Sometimes separate norms on speed and accuracy are necessary, as well as those based upon a combination of the two measures.

In the establishment of norms, specific information should be available, not only about the size of the group measured, but also about such facts as age level, whether the group is gainfully employed, whether it is a college population, or whether it consists of a normal unselected sampling. For example, a person who tests in the 70th percentile of a normal population on an intelligence test can be considered as having above average intelligence. However, his success in a Grade A college or graduate school would be questionable. In other words, a norm is meaningful only when the characteristics of the population upon which it is based are known.

A joint committee of the American Psychological Association, the American Educational Research Association, and the National Council on Measurements Used in Education has published a set of recommendations in connection with test standards (*14*). Were all test developers and publishers to adhere rigidly to these recommendations the consumer of tests would be on safer ground. The serious student of testing should be completely familiar with this set of standards. By way of illustration a selection of the more important recommendations is quoted. Even though the material is set in smaller type the reader is urged to pay particular attention to each principle listed.

A. Dissemination of Information

A1. When a test is published for operational use, it should be accompanied by a manual which takes cognizance of the detailed recommendations in this report.

A2. The manual should be up-to-date. It should be revised at appropriate intervals.

A2.2 When a test is revised or a new form is prepared, the manual should be thoroughly revised to take changes in the test into account.

A2.3 The copyright date of the manual or the date of the latest revision should be clearly indicated.

B. Interpretation

B1. Insofar as possible, the test, the manual, record forms, and other accompanying material should assist users to make correct interpretations of the test results.

B1.11 Interest and personality indices based on the self-report principle should be called "inventories," "questionnaires," or the like, rather than "tests."

B1.21 The manual should draw the user's attention to data other than the test scores which need to be taken into account in interpreting the test.

B2. The test manual should state explicitly the purposes and applications for which the test is recommended.

B2.1 If a test is intended for research use only, and is not distributed for operational use, that fact should be prominently stated in the accompanying materials.

B3. The test manual should indicate the professional qualifications required to administer and interpret the test properly.

B3.1 Where a test is recommended for a variety of purposes or types of inference, the manual should indicate the amount of training required for each use.

Level A. Tests or aids which can adequately be administered, scored, and interpreted with the aid of the manual and a general orientation to the kind of organization in which one is working. (E.g., achievement or proficiency tests.)

Level B. Tests or aids which require some technical knowledge of test construction and use, and of supporting psychological and educational subjects such as statistics, individual differences, and psychology of adjustment, personnel psychology, and guidance. (E.g., aptitude tests, adjustment inventories with normal populations.)

Level C. Tests and aids which require substantial understanding of testing and supporting psychological subjects, together with supervised experience in the use of these devices. (E.g., projective tests, individual mental tests.)

B4. When a test is issued in revised form, the nature and extent of any revision, and the comparability of data for the revised and the old test should be explicitly stated.

## C. Validity

1. The test user wishes to determine how an individual would perform at present in a given universe of situations of which the test situation constitutes a sample.
2. The test user wishes to predict an individual's future performance (on the test or on some external variable).
3. The test user wishes to estimate an individual's present status on some variable external to the test.
4. The test user wishes to infer the degree to which the individual possesses some trait or quality (construct) presumed to be reflected in the test performance.

Thus, a vocabulary test might be used simply as a measure of present vocabulary, as a predictor of college success, as a means of

discriminating schizophrenics from organics, or as a means of making inferences about "intellectual capacity."

Four Types of Validity

a. Content validity is evaluated by showing how well the content of the test samples the class of situations or subject matter about which conclusions are to be drawn. Content validity is especially important in the case of achievement and proficiency measures.

b. Predictive validity is evaluated by showing how well predictions made from the test are confirmed by evidence gathered at some subsequent time. The most common means of checking predictive validity is correlating test scores with a subsequent criterion measure. Predictive uses of tests include long-range prediction of intelligence measures, prediction of vocational success, and prediction of reaction to therapy.

c. Concurrent validity is evaluated by showing how well test scores correspond to measures of concurrent criterion performance or status. Studies which determine whether a test discriminates between presently identifiable groups are concerned with concurrent validity. Concurrent validity and predictive validity are quite similar save for the time at which the criterion is obtained. Among the problems for which concurrent validation is used are the validation of psychiatric screening instruments against estimates of adjustment made in a psychiatric interview, differentiation of vocational groups, and classification of patients. It should be noted that a test having concurrent validity may not have predictive validity.

d. Construct validity is evaluated by investigating what psychological qualities a test measures, i.e., by demonstrating that certain explanatory constructs account to some degree for performance on the test. To examine construct validity requires both logical and empirical attack. Essentially, in studies of construct validity we are validating the theory underlying the test. The validation procedure involves two steps. First, the investigator inquires: From this theory what predictions would we make regarding the variation of scores from person to person or occasion to occasion? Second, he gathers data to confirm these predictions.

C1. When validity is reported, the manual should indicate clearly what type of validity is referred to. The unqualified term "validity" should be avoided unless its meaning is clear from the context.

C2. The manual should report the validity of each type of inference for which a test is recommended. If validity of some recommended interpretation has not been tested, that fact should be made clear.

C3. Findings based on logical analysis should be carefully distinguished from conclusions established by correlation of test behavior with criterion behavior.

C4. If a test performance is to be interpreted as a sample of performance in some universe of situations, the manual should indicate clearly what universe is represented and how adequate the sampling is.

C5. When predictive validity is determined by statistical analysis, the

analysis should be reported in a form from which the reader can determine confidence limits of estimates regarding individuals, or the probability of misclassification of the individual on the criterion.

C6. All measures of criteria should be described accurately and in detail. The manual should evaluate the adequacy of the criterion. It should draw attention to significant aspects of performance which the criterion measure does not reflect and to the irrelevant factors which it may reflect.

C7. The reliability of the criterion should be reported if it can be determined. If such evidence is not available, the author should discuss the probable reliability as judged from indirect evidence.

C8. The date when validation data were gathered should be reported.

C9. The criterion score of a person should be determined independently of his test score. The manual should describe precautions taken to avoid contamination of the criterion or should warn the reader of any possible contamination.

C10. Test scores to be used in validation should be determined independently of criterion scores.

C12. If the manual recommends that interpretation be based on the test profile, evidence should be provided that the shape of the profile is a valid predictor.

C13. The validation sample should be described sufficiently for the user to know whether the persons he tests may properly be regarded as represented by the sample on which validation was based.

C14. The author should base validation studies on samples comparable, in terms of selection of cases and conditions of testing, to the groups to whom the manual recommends that the test be applied.

C16. Reports of validation studies should describe any conditions likely to affect the motivation of subjects for taking the test.

D. Reliability

D1. The test manual should report such evidence of reliability as would permit the reader to judge whether scores are sufficiently dependable for the recommended uses of the test. If any of the necessary evidence has not been collected, the absence of such information should be noted.

D2. The manual should avoid any implication that reliability measures demonstrate the predictive or concurrent validity of the test.

D4. If two forms of a test are made available, with both forms intended for possible use with the same subjects, the correlation between forms and information as to the equivalence of scores on the two forms should be reported. If the necessary evidence is not provided, the manual should warn the reader against assuming comparability.

D7. The manual should indicate what degree of stability of scores may be expected if a test is repeated after time has elapsed. If such evidence is not presented, the absence of information regarding stability should be noted.

E. Administration and Scoring

E1. The directions for administration should be presented with sufficient clarity that the test user can duplicate the administrative conditions under which the norms and data on reliability and validity were obtained.

F. Scales and Norms

F2. Where there is no compelling advantage to be obtained by reporting scores in some other form, the manual should suggest reporting scores in terms of percentile equivalents or standard scores.

F4. Local norms are more important for many uses of tests than published norms. In such cases the manual should suggest appropriate emphasis on local norms.

F7. Norms should refer to defined and clearly described populations. These populations should be the groups to whom users of the test will ordinarily wish to compare the persons tested.[1]

## Advantages of Testing in Industry

Testing in industry is a useful aid in modern business and deserves serious consideration, despite its shortcomings. The great advantage in testing is that it can improve the selection process. The problem of hiring inexperienced people often arises. Such employees need many months of training. The cost of hiring plus the cost of training often total between three and four hundred dollars per employee, and in many cases even more. If an employer expects to continue in a competitive business, such costs must be curtailed. Psychological testing can reduce the costs of hiring people who will be successful, for its goal is measuring aptitude and predicting ultimate success among inexperienced applicants. However, as Brown and Ghiselli point out, it is not safe to assume that tests which best predict trainability also predict job proficiency equally well (*6*).

They made an exhaustive review of all studies reporting the correlation between test performance and the two criteria—trainability and job proficiency; they found only a slight tendency for a test that proves useful in predicting trainability also to be useful in predicting job proficiency, and vice versa. This means that factors important in learning a job may differ considerably from those that are important in maintaining proficiency on the job. This point is of vital importance in recognizing that one cannot make assumptions based upon incomplete facts. To be certain one must laboriously gather all the facts. After all, a bright person with

[1] Reprinted by permission of the American Psychological Association.

certain skills may learn a job very fast but if the job is not a challenging one and he is too good for it he may terminate or perform in a manner considered unsatisfactory by his superiors.

Psychological tests can also be useful in the selection of experienced applicants. In many instances these tests serve as the only good check on the exaggerated claims of an applicant. Some applicants successfully bluff their way through an application blank and an interview, but faking a good test is much more difficult. Many girls who claim to have experience as power machine operators base their claim on nonindustrial experience; there is a sewing machine in their home and their mother has taught them to use it. They also claim to know the operations of the machine as well as various types of stitching. An interview cannot check such claims, but a standardized test can establish the accuracy as well as the speed of performance. Further, when norms are available, the individual's ability can be judged more accurately than is possible when judgment is based solely upon an interview.

Psychological testing is also useful in selecting people with promotional ability, discovering reasons for job failure based upon personality traits, and even determining susceptibility to accidents.

### Major Limitations of Testing

It is not unusual to find that psychological testing correlates imperfectly with job success. Correlations of the order of +.30 to +.50 are often the best that can be hoped for. From the point of view of the statistician, such correlations are too low for individual prediction purposes. The relationship is nevertheless useful, for even such slight help in predicting success is better than if no tests were given. After all, just because we cannot use our arms as wings and fly does not mean that we ought to cut them off.

In the discussion of job satisfaction and morale in Chapters 5 and 6 we said that other factors, in addition to an individual's ability, helped to determine performance. Very often compelling reasons for continuing on a job compensate for an employee's limited ability. On the other hand, for many reasons a person may be a failure on a job even though he has the ability to be successful. Success or failure on any job depends upon other things besides ability. Most industrial testing programs limit the functions to be measured to mere ability and do not consider the other contributing factors. Furthermore, the claim cannot be made that even ability is perfectly measured.

It is no wonder that psychological tests in industry cannot do a perfect job at the present time. Anyone who expects perfection is unaware of the real situation. For example, a girl who worked in a certain watch factory had an abnormally poor score on a finger and tweezer dexterity test. In this instance better test scores were correlated with better job performance. This girl actually had a poor production record; and since salary was determined on a piece-rate basis, her earnings were very low. She was also rated as a poor worker by her supervisor. Nevertheless, this girl was among the workers who had the longest tenure of employment. An interview with her revealed that she was under extreme financial pressure and simply could not afford to be out of work one day. Moreover, experience had taught her that she did not last at jobs very long, except for her present one, and so she was content to stay on even though the psychological test predicted poor ability and her productions records verified the prediction. An opposite example is offered by the man who made an excellent score in a battery of tests for salesmen. He possessed all the traits and abilities considered desirable but had worked out very poorly on the job. An interview revealed that he was married to a wealthy woman and did not need money; he had taken the job in order to acquire a cloak of respectability. The fact that he did not sell as much as the next fellow was of little concern to him.

The practical expediency of costs often determines the extent of the test battery. For the average job the cost of testing would be excessive if the test period required more than twenty or thirty minutes. Since all the aspects of ability cannot be measured in this time, the effectiveness of the test battery is necessarily lowered. Psychological tests are useful but limited in scope. We repeat this over and over, not to defend or attact testing, but to give a clear and honest understanding of the possibilities. Test development is desirable, but care must be exercised that testing does not boomerang.

### People's Attitudes Toward Tests

It must be remembered that all the people who take tests are human beings and must be considered as such. It is safe to say that the average individual, regardless of his previous success or failure with psychological or school tests, does not relish the idea of being tested. He is likely to be "nervous" and frightened, and to exhibit anxiety and manifest considerable tension. In giving a test to an individual, the objective is to obtain that person's most typical functioning. The above behavior interferes

with such functioning. However, the extent of interference can only be estimated. Chances are that the inexperienced examiner underestimates this interference to the same extent that the subject overestimates it; the happy medium is somewhere in between. The experienced examiner takes pains to develop rapport. He is frank and interested and explains the purpose of the test within the limits of the directions. He attempts to encourage relaxation or at least the absence of tension in the subject.

An individual displays fear of psychological tests for many reasons. He may feel that the test will be unfair and thereby prevent him from getting the job. Also, he may be unable to estimate whether he is doing well or poorly. He often thinks that the test is an imposition to which he should not be subjected since he is applying for only a menial job. He realizes that the test is a challenge, and like most people he prefers not to be challenged in this manner. For all these reasons the attitudes of the person taking the test must be taken into consideration.

The employer who sponsors a testing program has still another point of view. Frequently his motives are not altruistic but are concerned with dollars and cents. For him the real question is how many dollars will be saved as a result of the test program. Naturally, the cost of the program can be determined, but few psychologists, regardless of their experience, are able to estimate with anything resembling reasonable accuracy the savings which may accrue. A safe prediction might be that the use of tests may result in a production improvement of 10 percent. To make a reasonably accurate estimate, the psychologist would have to know the cost of the training program per individual, the profits before and after the introduction of the program, and other related figures. Most employers do not give this information to strangers, even psychologists.

Some employers are willing to introduce a testing program and pay the psychologist a fee based upon a certain percentage of the money saved. The ethics of such a proposal are questionable, but it can certainly be said that the arrangement is unfair to the psychologist and should be avoided. After all, a surgeon is paid regardless of whether the patient lives or dies; in fact, he is often paid in advance. Also, as we said earlier, an employer sometimes grasps at psychological tests as a last straw to help him with a problem that psychological testing really cannot solve. Unless he is acquainted with the possibilities of the tests and warned that the chances of success are not certain, he may become annoyed, dissatisfied, and even anti-psychological testing.

A third group of people whose attitudes toward psychological tests

should be mentioned are union officials and members. It is safe to say that, up to the present time, unions have not been very sympathetic to psychological testing programs. Part of this reaction can be accounted for by the unions' mistrust of "scientific" management, for they erroneously consider psychological testing as a phase of "scientific" management. Business organizations which have union contracts are likely to encounter difficulty in introducing a test battery as a means of selecting employees. Correctly or incorrectly, the union figures that this is an attempt to hedge on the various clauses in its contract that deal with the closed shop or general hiring practices. Many union executives believe that psychological testing serves only the interests of the employer; the fact that it advances the interests of the employee is open to debate. The unions' general disapproval of psychological testing programs must be reckoned with in a unionized industry.

### Introducing a Testing Program

The introduction of a testing program in a business organization demands that a research program accompany it. Attempts to select applicants with the aid of psychological tests based upon opinion and judgment rather than statistical facts are rarely if ever justified.

Before introducing a test battery it is extremely advisable to consult an industrial psychologist. He not only has training and background in tests but has had experience with different testing programs. He knows that there is no short cut in the process, and that a testing program must be accompanied by research. There is a practical reason for research to parallel a testing program. A decision must be made as to which applicants will be recommended for hiring and which will be turned down. It is not at all safe to assume that the best applicant—that is, the one with the highest score—will be the best person for the job. For example, it has been unequivocally determined that in many occupations the people with the highest scores on an intelligence test are not necessarily the most successful employees. It has been established that in many jobs scores above a certain point are conducive to inefficiency and high turnover. In these occupations the best employee, from the point of view of a prediction based upon an intelligence test score, is the one who ranks in the middle range. It is often necessary to establish a maximum score on a test, above which it is unsafe to hire; a minimum score must also be established, below which it is unsafe to hire. In other words, test results must be compared with success on the job, and a minimum critical score, and

sometimes a maximum critical score, be established for hiring purposes.

Another reason for employing the services of a psychologist is that some tests have misleading names; they can be used for selecting workers in occupations other than that implied by the name of the test. For example, the Minnesota Clerical Test is a name-checking and number-checking test, but it has been found useful in the selection of department store packers and also inspectors. In both these instances the usefulness of this test was greater than when it was used to select clerical workers.

It cannot be expected that a battery of psychological tests which have been used successfully in one company will give the same degree of success in another. The type of personnel in two neighboring plants manufacturing the same type of product may vary tremendously. Such factors as working conditions, morale, and selection may, if known, predispose the better applicants to seek jobs in one plant rather than the other. Moreover, age, sex, and religion as a basis of selection are often artificial factors and may vitiate the validity of the testing program.

Because of relatively recent school experience, young people are often more familiar with pencil and paper tests and as a result do better on them. Older people may be frightened at the very thought of writing, as a result not only of passive decay but also of certain unpleasant memories connected with school tests. If factory A hires young people and gives a pencil and paper test, such a test may work for that factory. Factory B may be just as successful from the point of view of production but may hire older people who are equally efficient. This factory will probably not be able to use the pencil and paper test which was successful in factory A. The principle that test batteries should not be borrowed is important. Naturally, this does not mean that one should not attempt to benefit from the experiences of others, for such information may provide useful leads.

The only justification for using psychological tests for selection purposes is based upon the assumption that the test results have a statistical relationship, known as correlation, with success on the job. This must be established before it is either safe or advisable to hire on the basis of psychological testing.

Tests should be used in industry only when the test results are known to be related to job success. At this point it is necessary to ask what job success is. This is not a simple question; on the contrary, it is very complicated. Serious thought will bring out many difficult angles. The performance of any job, no matter how simple, can be measured in a number

of different ways. For example, total production may be a measure of success on the job; hence the more an employee produces the greater his success. On the other hand, total production may need qualification because spoilage may enter the picture. In other words, a second criterion of success on the job is accuracy of production. If these two factors are perfectly correlated, there is no problem. But they never are, and so both must be considered as criteria of success. The problem is further complicated by the fact that there are additional criteria of success. For instance, ratings of supervisors measure an aspect of a worker's efficiency. These ratings are related to the previously mentioned factors to some extent, but the relationship is small enough to demand that the ratings be considered a separate factor. After a certain period of employment, the worker may be considered as having paid for the cost of his training, and so from the employer's view the employee is thought successful when this period has been passed. Hence length of employment is also a criterion of success.

In certain jobs earnings are determined on a piece-rate basis, and earnings and production records may be perfectly correlated. However, since few claim that the piece rate in one department of a factory is exactly equal to the piece rate in another department, earning capacities may vary. Therefore, similar earnings may not represent similar production ability.

Some jobs have criteria of success peculiar to the job. In selling on a commission basis, the more the salesman earns the better he is assumed to be; hence actual earnings can be considered as still another criterion of success. Ability to advance beyond the original job is sometimes taken as another criterion of success.

In any organization contemplating the use of psychological tests, job success must be clearly defined. In some instances, one criterion may be considered to the exclusion of all the others. From the point of view of correctness and accuracy it is best to combine all the available criteria into a single measure. Statistical techniques have been devised for this purpose. It must be remembered that hiring based on tests can be effective only when there is a basis for comparing the test scores with the criteria of job success.

### Steps in the Development of a Psychological Test

It is highly unlikely that any single psychological test will be 100 percent effective in the selection of employees, because no job ever depends

upon any single ability or aptitude. If the major component of a minute assembly job were finger dexterity, it would nevertheless be necessary to recognize that other minor components, such as eye-hand coördination, strength of grip, intelligence, interest, and adjustment to the job situation, should also be considered. In this case, the finger dexterity test would be useful to diagnose ability in that part of the job calling for finger dexterity, but it cannot predict concerning the other components of the job. This being the case, it is always advisable to have a test battery which consists of either a single test made up of a number of subtests, or several different tests.

A psychological test must be standardized and for industrial purposes a minimum of seven steps must be taken. *Step 1* is a complete analysis of the job. In a later chapter the uses and importance of job analysis will be discussed and the methods for conducting such an analysis described. From the point of view of psychological test development, an understanding of the duties and requirements of a job as determined by a job analysis is essential. Before the abilities required for the successful performance of a job can be measured, it is necessary to analyze the job to determine these abilities. For instance, there is much more to selling drugs wholesale than is at first apparent. A job analysis reveals that the salesman has many duties. He advises the drugstore owner on merchandising and displays and recommends inventory systems. At times his ability to sell his products is based to some extent on his knowledge of the pharmacist's stock. He advises the pharmacist on the development and uses of new products. He must be a good listener, especially when the pharmacist wants to gripe to someone. Of course he must also be able to write orders. Large wholesale drug companies have different lines and the commissions paid often vary according to the line being sold. These factors and many others are uncovered in a job analysis. Since no job is ever as simple as it looks, a job analysis is a prerequisite to the other steps in development of a test.

*Step 2* is the preliminary selection of a battery of tests. As soon as leads are available from the job analysis, the psychologist decides on the battery of tests which he believes will best measure the various—or at least the major—components of the job. If no tests are available, he may have to develop a series of questions or a performance task which he believes is heavily weighted in the job components which are necessary for prediction. For example, most of the available psychological tests cannot actually measure success in operating a power machine. Here it might be

best to use a job sample for testing. In a study on the selection of sewing machine operators Blum (2) devised a zigzag pattern which the subjects were required to follow, using an actual machine with a needle but no thread. They were also required to sew a zigzag pattern in between two lines.

Before this job sample could be claimed to be a valid test for selection, it was necessary to test the test. In this particular study it was found that this sewing task was moderately helpful in selecting experienced operators but was practically useless in selecting inexperienced operators, i.e.,
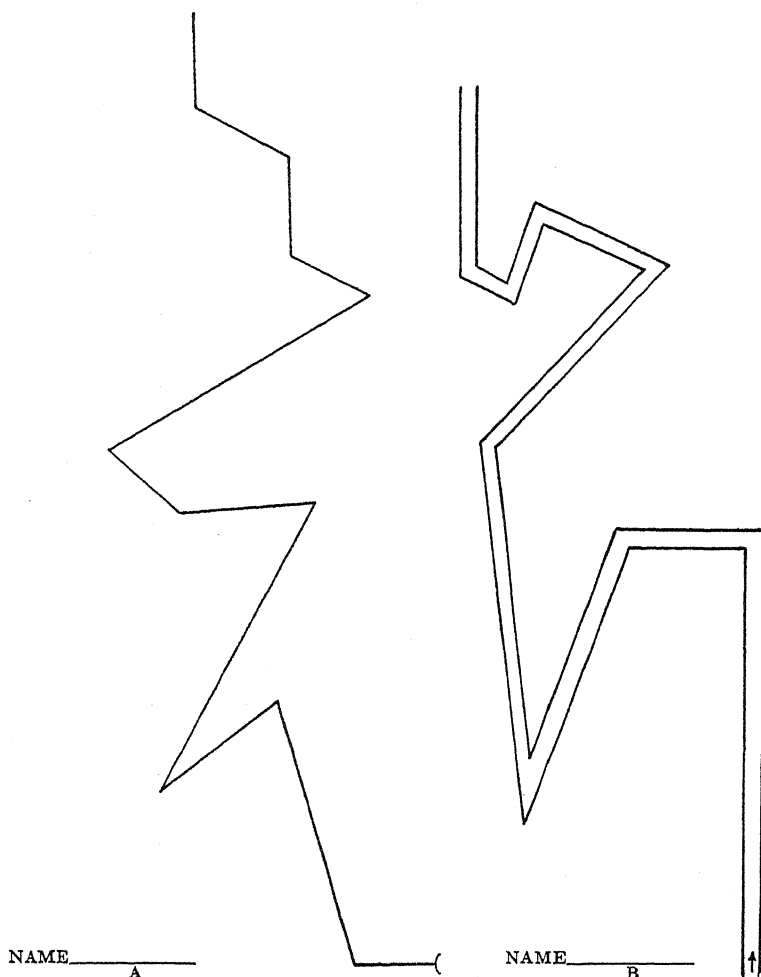
*Figure 10.1.* Blum Sewing Machine Test. (From M. L. Blum, Selection of sewing machine operators, *J. Appl. Psychol.* [1943], *27*:35–40.)

in predicting who would become good operators. Testing the test is the crux of the entire problem of industrial testing. A test should never be used unless it has been tested in the specific situation. Therefore, the choice of a preliminary group of tests in step 2 is primarily a matter of judgment. The psychologist uses his best judgment, but it cannot be accepted as valid.

In *step 3*, the psychologist administers the preliminary battery of tests to a group of individuals whose degree of job success can be determined. The number of people to be tested is often determined by the expediencies of the situation. Naturally, the larger the number the better, but sometimes no more than twenty subjects are available in the organization. At this point costs must also be considered. A safe practice from the point of view of economy is to conduct a pilot study. A pilot study is a full dress rehearsal on a small scale. It enables the psychologist to predict the chances of success if he were to start testing very large groups. It is also useful because it serves as a check in the last step to be described.

*Step 4* involves determining the actual abilities of the people being tested. This means measuring job performance according to the criteria of success available. Although this step does not involve psychological tests it is an important and essential part of test standardization and must be carefully worked out. Most psychologists working in industry judge the value of a testing program on its relation to the criteria. One psychologist, Drake, considers this step unnecessary; he believes that the worker's performance on the test should be regarded as the criterion itself, and that work performance in turn should be evaluated against test performance. This view, according to the present author, is either a little ahead of the times, because psychological tests are not that good, or an attempt to evade the difficulty of determining job criteria.

In *step 5* the subjects' scores on the tests are compared with a measure of their abilities. This step requires a careful examination not only of the total score on the test but of the scores on the various subtests, as well as the answers to the various items. If some of the test items or the total score differentiates with statistical significance between the good and the poor employees, the test can be considered to have value. If there is no statistically significant difference between the results of the tests on the two groups, the tests cannot be considered as having value and must be rejected.

It should be noted that when employees are tested the poor ones are not likely to be substandard, but marginal or mediocre. After all, the

really inferior employees either leave or are fired. Testing applicants who have been hired, regardless of their test score, during the experimental stages of developing the test battery shows that ignoring of scores sometimes produces a group of poor employees. The fact that very poor employees, at least from the point of view of actual ability, are hardly ever found on the job makes the testing problem difficult.

*Step 6* requires the examination of the accepted tests or test items. Here extended statistical analysis is necessary. For example, some of the items on the test may discriminate much more keenly between the two groups than other items. Naturally, such items should be given greater mathematical weight. The exact mathematical weight should not be an arbitrarily assigned number such as 1, 2, or 3 but should be determined with statistical accuracy.

The *final step* in developing a test or test battery is its administration to a new and preferably larger group. This step should never be overlooked because it provides a very important check. In addition, this step is necessary to establish the reliability and validity of the test battery, and also the norms. Many attempts have been made to develop a battery of tests to select salesmen. In some instances the preliminary battery has shown considerable promise. However, when the test has been administered to another group, the promise has often evaporated into thin air. This means either that the statistical findings for the original sample were not statistically reliable or that the original sample was unique and not representative. Cross validation should never be overlooked.

Only when the procedure described in all these steps has been carefully followed can a particular industrial organization be in a position to know the value of the testing program it has introduced.

All this should not be regarded as extreme negativism; it is not intended to discourage the use of psychological testing in industry. On the contrary, provided that too much is not expected of it, testing can be extremely useful in industry. Its real value and extended use in the future will depend upon the exercise of rigid discipline and caution in its use at present. The prognosis for the development and use of testing is good provided it does not get too many black eyes and bruises in its current stage of development.

A final consideration, once a test battery has been developed, is the relation between the critical score and the availability of the labor supply. In the study on the selection of sewing machine operators previously referred to the relation between the critical score and the percentage of

the good and poor groups eliminated was established. Table 10.1, which presents this relation, shows that with a critical score of 260 seconds or over, one out of every five employees in the poor group would have been eliminated and all those in the good group would have been included. This is far from adequate because 80 percent of the poor employees

Table 10.1. Critical Score and Percentage of Groups Eliminated

| Critical Score | % of Poor Group Eliminated | % of Good Group Eliminated |
|---|---|---|
| 260+ | 20 | 0 |
| 240+ | 28 | 4 |
| 220+ | 56 | 20 |
| 200+ | 72 | 28 |

would have passed this testing screen. On the other hand, if 200 or more seconds is the critical score, seven out of every ten poor employees would have been eliminated, but three out of every ten good employees would also have been excluded. If the labor supply is limited it is sometimes impossible to eliminate three out of every ten potentially good employees; hence a compromise must be reached. In this particular study it was recommended that the critical score of 200 seconds be used; but when the labor market is very tight the score would have to be lowered.

In addition to the fact that the introduction of testing in industry demands research and that tests cannot be passed on as a unit from one organization to the next, the previous uses of the test in question must also be considered. For example, there is a test on the market called the "two hand coördination test," but careful check of the literature reveals no references to it. To quote private correspondence with the author: "All that we have on the test so far are percentiles. Administration has not been sufficiently standardized so that we get high reliability from one situation to another. Several validity studies have looked promising but we also get such high correlation between this test and our hand dexterity test that I am coming to believe that the simple hand dexterity test is sufficient in most situations." A brochure describing the test claims that it provides a "sharp instrument" for eliminating unfit candidates. A test that is relatively unreliable and has questionable validity does not meet the standards of psychological testing. This test is certainly not the "sharp" instrument that it is claimed to be. A psychologist would not fall

for such assertions. He investigates facts, not opinions and claims, in considering a test for selecting employees.

Another example is an advertisement in a trade journal which claims that a certain peg board measures the dexterity required for successful performance on the job. The relationship between a job analysis and the abilities or aptitude measured by this so-called test is extremely remote, if not nonexistent. For all practical purposes the test consists merely of a piece of wood painted in different colors, and a series of large pegs which are to be put in the various holes that have been made in the wood. If any research of the type described in this chapter was ever conducted prior to the sale of this test, the writer will be willing to eat the pegs and the board.

## Range of Testing

There are literally hundreds of psychological tests for measuring a wide range of abilities, aptitudes, personality traits, interests, and attitudes. They differ in accordance with whether they are individual or group tests. An individual test is given to one person at a time; the examiner must be experienced. A group test can be given to groups of people at the same time. However, no hard and fast rules differentiate individual and group tests. With slight modifications some individual tests can be given to small groups at one time, and by the same token a group test can be given to one individual.

Psychological tests also differ according to whether they are performance tests of a manipulative variety or pencil and paper tests of the verbal variety. But even this is not a clear-cut distinction because some performance tests are given by means of pencil and paper tests. MacQuarrie's mechanical ability test is a pencil and paper test which measures performance.

For the practical purposes of industry, psychological tests can be grouped into four categories: intelligence, personality, achievement, and aptitude.

The intelligence tests used in industry are of the pencil and paper variety and are short. One such test widely used in industry is the Otis Mental Ability Test. It consists of 75 items and includes questions on arithmetic, vocabulary, the following of directions, and general information. A modification of this test has been devised by Wonderlic (*15*) and the time limit has been reduced to twelve minutes. If one wants a crude estimate of intelligence and is willing to interpret the results loosely, either of these tests is useful. But if accuracy of interpretation is required,

especially when employees are to be selected who will need to undergo an intensive training period of a year or more, it is advisable to use an individual test such as the Wechsler-Bellevue or one of the longer pencil and paper tests.

Personality testing in industry is far behind intelligence testing. The personality tests are often of the inventory type. A series of questions is asked and the subject is encouraged to answer them candidly and truthfully with a "yes" or "no." The nature of the questions depends on whether introversion, neurotic tendency, or another of the so-called "personality traits" is being measured. Typical test items are:

Do you worry over possible misfortunes?
Does discipline make you discontented?
At a reception or tea do you feel reluctant to meet the most important person present?
I seldom worry about my health.
Look for sympathy?
Mind wanders easily?

The major limitation of such tests for selection purposes is obvious; the applicant's answers may indicate not what he really thinks but what he believes he should answer in order to get the job.

A more meaningful approach to the measurement and understanding of personality is afforded by tests using the projective techniques. These techniques present a relatively free situation to the individual and the exact answer is determined by what he projects into the situation. For example, the Rorschach test presents a series of ten standardized ink blots to the subject. In each instance the subject states freely what he sees, either in part of each blot or in the complete blot. The examiner, who must be trained in this technique, analyzes the results in numerous ways. The scoring is based on the type of response—whether the subject reports movement of human figures, animate or inanimate objects, etc. The rigid supporters of this technique exhibit an almost religious fervor in their claims. The test does have diagnostic value in analyzing personality and emotional aspects of the individual, and even the intellectual level can be estimated.

Another test of this variety is Murray's Thematic Apperception Test, in which a series of pictures is presented to the subject; he is asked to tell an extemporaneous story about each picture. Analysis of the stories, especially when the same themes are repeated, reveals his dominant drives, as well as his conflicts and inhibitions.

Balinsky (*1*) administered the Rorschach to the two final applicants for

a job as plant superintendent of a machine shop. Both men fulfilled all the technical requirements, but the personnel director wanted to make certain that the personality of the man selected would be suited to the social atmosphere in the shop. The responses to the test were interpreted in terms of the following eight points:

1. Basic attitude.
2. Drive.
3. Relation to authority.
4. Relation to subordinates.
5. Performance level.
6. Responsibility.
7. Persistence.
8. Initiative.

The relation between Mr. Z's Rorschach and the personnel director's impressions after Mr. Z had been employed eight months was as follows:

| Rorschach | Personnel Director |
|---|---|
| Basic Attitude: | |
| Moderately self-assertive, especially in new situation. Will probably try to be more self-assertive by a conscious effort. | Moderately self-assertive. |
| Drive: | |
| Tendency toward strong drive and push which seems commensurate with his ability. Will probably be able to get things done quietly and without fuss. | Got things done without fussing. Showed a strong drive. |
| Relation to Authority or Superiors: | |
| Will be very cooperative but will not be uncritical. | Cooperative with management and offered feasible suggestions. |
| Relation to Subordinates: | |
| Seems to be sympathetic toward people and aware of their differences and difficulties. Will probably get good cooperation from men. Is himself very critical and shows signs of stubbornness occasionally. | Well liked by men in shop and they trusted him. |
| Performance Level: | |
| Generally even and high grade. Is methodical and cautious in approach. | Quality of work was good and he was meticulous about what he did. |
| Responsibility: | |
| Has high sense of responsibility. Does not shirk from a task. | Accepted responsibility early. |
| Persistence: | |
| High degree of persistence and used imagination when in difficult situation, not giving up or finding an unrealistic and impractical way out. | Very persistent until he finds a solution. |

| Initiative: | |
|---|---|
| Has initiative, but may need encouragement to put it into action. When he is more used to the situation and feels more secure, he will probably show more initiative. | Showed initiative almost immediately by ironing out certain production difficulties which he found existed. |

The personnel director was very well satisfied with the selection of Mr. Z.

There is no doubt that the personality test is important and useful in industry. Use of the projective techniques is limited, because the examiner must have considerable training and the tests are time-consuming from the point of both administering and scoring. For most jobs selection by such tests would be prohibited by the costs. However, industry should whenever possible overlook these disadvantages, for this type of test is likely to be useful in selecting people for important jobs. Despite their limited industrial use up to the present, these tests show much more promise than the pencil and paper inventory variety.

Achievement testing in industry is often called trade testing. It is very useful, especially when an interview cannot establish the degree of ability. A trade test deals with a specific task and has been standardized so that the reliability and validity of the test are known and norms are available to make possible an evaluation of the candidate. In the selection of butchers, plumbers, stenographers, and typists a trade test can be worth a thousand-word interview.

Aptitude testing in industry is important when inexperienced people are to be selected. The theory underlying aptitude tests is that they measure a present ability which is related to the required future ability. Future ability is not measured, for that is not within the realm of psychological testing and should be relegated to the quackery basket along with fortunetelling, etc. For example, finger dexterity measures the ability to use the fingers and manipulate minute parts. A finger dexterity test is not necessarily an assembly test, but it can be considered an aptitude test for watch factory assembly because the subject's finger dexterity ability at the time he is tested can be correlated with the ability he must have in the future for watch factory assembly. Caution is necessary in aptitude testing, for the test must be ultimately related to the job. In actual practice, aptitude testing fills a greater need in vocational guidance work. The only instance when it is justified in industry is when inexperienced workers are to be hired and trained.

### Problems of Administering Tests in Industry

A very important reason why a psychologist experienced in psychological testing should be employed for a test program in industry lies in the nature of the problems that arise in giving tests. Applicants or employees who take tests are likely to be cautious. They need encouragement in order to give their most typical performance, and they must be given honorable guarantees. Regardless of their success on the job, employees worry about the test, for they feel that poor test performance may cost them their job. If the precaution of dispelling such ideas is not taken, they are likely to show antagonism and resentment, and the employer will have a serious problem of morale on his hands. Much of their anxiety can be relieved by statements to the effect that the testing program to be used in the company in the future will depend upon whether the established employees do well on the tests, and that if the employees do not do well on them it will mean that the tests are unsuitable for the company. It is also desirable, when possible, not to give the employer the exact test results in any individual case; knowledge that individual test results will not be revealed gives the employees further reassurance.

The attitude of the examiner while administering the tests is important. He must be friendly and show a personal interest in the subjects but still maintain the standardized conditions for the test. He must know how to cope with unanticipated responses during the testing—laughing fits, talking, and even cursing. Ability to handle these so that they cause a minimum of interference is a prerequisite of an experienced examiner. The person administering the test program not only should be trained in psychological testing techniques but should spend an apprentice period with an experienced examiner. This is true regardless of whether he has a master's degree in psychology or not. Some years ago the author hired an outstanding graduate student who had his master's degree to administer an industrial testing program. The student phoned him that the tests could not be given because of a broken stop watch. The author's hurried taxi ride with a spare stop watch proved to be unnecessary, for the student's watch merely needed winding. In his many courses, the young man had never been taught to wind a stop watch.

### Summary

The psychologist's accepted role in industry is the administering of psychological tests. Within limits, testing can be useful as an aid in the selection process, but it should not be regarded as a panacea; its greatest

danger is in being oversold. A psychological test is a sample of behavior which predicts the most typical functioning of that behavior. The three characteristics essential to psychological tests are validity, reliability, and norms.

The introduction of testing in industry requires that research run parallel with the test. Care should be exercised that psychological tests are developed in a standardized fashion.

Considerable progress has been made and the code of technical recommendations if adhered to by test distributors will go a long way toward sedimentation of muddy waters. Test batteries cannot be handed from one organization to the next, because they often are valid in one company but not in another. Further, tests that may be useful in predicting trainability may not be effective in predicting job efficiency. The reverse is also possible. The range of psychological tests is wide and includes many tests of intelligence, personality, achievement, and aptitudes. In psychological testing the attitudes of the applicant, the employee, the employer, the union, and the psychologist must be considered if the testing program is to have a fair chance of success. Psychological tests are helpful in selection, provided not too much is expected of them.

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# CHAPTER 11

# Psychological Testing Programs Used in Industry

THE development and use of tests in industry are widespread at the present time, and they promise to be continued on an increasingly broad and varied scale. This chapter will deal with the scope of the tests actually used by various industrial and business organizations and will present intensive reviews of several of these testing programs.

A selected and annotated bibliography on employment tests used in industry and business was compiled in 1945 by the Industrial Relations Section of the Department of Economics and Social Institutions at Princeton University (*5*), under the direction of J. Douglas Brown. Approximately 350 references are included, and good judgment has been exercised in the selection of the material. Since it presents a brief survey of the various kinds of tests which have been used in this field, it should be very useful for the student of psychological industrial tests.

Oscar K. Buros has edited a series of *Mental Measurements Yearbooks* (*6*) and is steadily engaged in keeping the material in this field up to date. These yearbooks are a much more comprehensive and complete source because they embody a critical survey and are not limited to industrial tests but include practically all the work which has been done in the entire testing field. A group of contributors carefully selected by Buros reviews all the available material on practically all the psychological tests.

Jones (*15*) reviewed over 2100 references on employee selection and selected 427 studies as representing the "cream of the crop." The 10 classifications of workers most frequently studied were: salesmen (75), clerical workers (60), teachers (49), assemblers (23), executives (23), inspectors (23), supervisors (21), typists (17), stenographers (14), and machinists (9).

However, the important point of the article is that Jones found only eight studies reported which met the criteria of adequacy in both experimental design and report. So that the more serious student may refer to these studies they are listed as follows:

1. Bellows, R. M., Studies of clerical workers, Chap. VIII in W. H. Stead, C. L. Shartle, *et al.*, New York, *Occupational Counseling Techniques*, American Book Company, 1940, pp. 144–146. (Study of coding clerks)
2. Blum, M., and Candee, B., The selection of department store packers and wrappers with the aid of certain psychological tests. *J. Appl. Psychol.* (1941), *25*:76–85.
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Jones concluded by listing five requirements of a research report on employee selection using psychological tests. They are:

1. Detailed job description, with each group treated separately.
2. Complete description of the sample: N (sufficiently large), what proportion of the total population this represents and how selected, factors involved in hiring, age, length of time on the job (preferably with widely differing employees treated as separate groups), and total experience in jobs of similar nature; use of two samples, one an applicant group.
3. Exact test titles; when in the employment experience the tests were administered; whether the tests were a factor in hiring; where the tests were given; under what conditions and incentives the tests were given; reliabilities of tests with comparable groups.
4. Detailed description of the criterion; length of time on the job when the criterion measure was applied (with widely differing employees treated as separate groups); reliability of the criterion; some discussion of the validity of the criterion selected; if ratings are used, some estimate of the amount of

contact the rater has with the employee; if production records are used, the duration of the period and whether there were any unusual factors operating at that time.

5. Adequate statistical treatment, with assurance that the assumptions governing the use of the given measures have been met, and actual report of the numerical results, together with an appropriate measure of significance.

Dorcus and Jones have published a volume of abstracts (9) which is essentially the record of the 427 "cream of the crop" studies referred to in Jones' study. It includes over 200 occupations listed alphabetically from accountant to YMCA secretary and reports such items as: subjects, tests used, criterion, validity of results of the study, and relability of the criterion. A sample abstract is as follows:

Surgent, L. V.: The use of aptitude tests in the selection of radio tube mounters. *Psychological Monographs,* 1947, 61 (283). Pp. 40.

1. Subjects: 233 radio tube mounters, female. Tests used as part of application procedure but results not used in selection.
2. Tests: (1) Minnesota Rate of Manipulation Test: Placing, (2) Minnesota Rate of Manipulation Test: Turning, (3) O'Connor Finger Dexterity Test, (4) Purdue Pegboard, (5) O'Connor Tweezer Dexterity Test.
3. Criterion: a single over-all rating based on the pooled judgment of the supervisor of training and 2 instructors; 5-point scale; rating during training period.
4. Validity: biserial correlation between test scores and criterion (groups divided into satisfactory and unsatisfactory):

| Test | Correlation | t |
|---|---|---|
| 1 | .56 | 6.56 |
| 2 | .50 | 5.79 |
| 3 | .48 | 5.60 |
| 4 | .64 | 7.39 |
| 5 | .59 | 6.81 |

Multiple correlation of test scores and criterion (optimum order of test addition):

| Test | Correlation |
|---|---|
| 4 | .64 |
| 5 | .72 |
| 1 | .76 |
| 3 | .76 |
| 2 | .76 |

Follow-up of 35 of the 233 mounters: prediction of criterion scores on basis

of a regression equation correlated with over-all rating by immediate supervisor on the job:

Two-test equation, involving Tests 4 and 5: .60

Three-test equation, involving Tests 4, 5, and 1: .43

5. Reliability: rank-order intercorrelations (N = 51) of 2 over-all fitness rankings and rankings of quality and quantity of work produced in training (latter 2 one week after first):

| Items | Correlation |
|---|---|
| Quality and quantity | .66 |
| Quality and over-all fitness rating | .74 |
| Quantity and over-all fitness rating | .85 |

The work of Brown, Buros, Jones, and Dorcus and Jones forms a sound base for the dissemination of information on test standardization and on psychological test use and research.

### Companies Using Psychological Tests

To list all the companies in the United States that use psychological tests would be a lengthy and impossible task, impossible because test results are often described without mention of the specific companies involved. Moreover, the companies that pay for research sometimes regard the material as "top secret" or as their private property, and so their policy is to discourage reports in the literature. Such a policy often gives a company an advantage over its competitors and from this point of view the policy is wise, but it constitutes an obstacle in the development and use of tests. An incomplete list of the companies which have used psychological testing can be made, however, and in some respects may be said to comprise an industrial "Who's Who." A random list of some of the companies and the tests they use is as follows:

The Johnson & Johnson Co., well-known manufacturers of surgical bandages, have used tests to select foremen and clerical workers. The Vega Airplane Co. and the Curtiss Wright Corp. use tests in their selection process. R. G. Le Tourneau, Inc., has developed a battery of tests to measure the primary mental abilities needed for job success with them. The Sun Oil Co. has been interested in developing a battery which would be suitable for selecting people who could be trained to operate machine tools. The Lockheed Aircraft Corp. has had successful experience with personality, intelligence, and mechanical aptitude tests in the selection of many different types of employees. The Hawaiian Sugar Refining Corp. has found the use of tests for the promotion of employees successful.

Aptitude tests as well as intelligence tests have been used by the A. C. Spark Plug Division of General Motors, the Woodward Governor Co., and Martin and Schwartz, Inc. The Harwood Manufacturing Co. and the Kaiser Glove Co. are two firms in the needle trades which have hired operators with the aid of tests. The American Aluminum Co. selected a group of prospective foremen for training on the basis of psychological test scores. Apprentice tool makers are hired by the Scovill Mfg. Co. with the aid of tests. The Milwaukee Electric Railway and Light Co. uses a battery of many tests to select a category of employees known as "electrical trouble men." The Philadelphia Electric Co. has found tests helpful in the selection of substation operators. Westinghouse Electric Co. uses tests as part of its promotion program for clerical workers. The Atlantic Refining Co. selects men for responsible positions, such as accountants and statisticians, with the aid of tests. Most of the insurance companies—among them the Liberty National Life Insurance Co., the Aetna Life Insurance Company, and the Metropolitan Life Insurance Company—have found test batteries helpful in selecting agents.

The Harris Trust and Savings Bank of Chicago uses both personality and intelligence tests in its selection process. Considerable research has been done by the Kimberly-Clark Corp.; this concern has developed its own tests, such as the Kimberly-Clark packing and inspection test, which have been made available to the profession.

W. T. Grant hires clerical workers on the basis of tests. The Tremco Mfg. Co. has done much research on the selection of salesmen. R. H. Macy has used psychological tests for years in hiring employees for many of its departments. Procter and Gamble has found tests useful in selecting salesmen and sales managers. Aptitude tests have proved valuable to the Todd Company in hiring salesmen.

This list has not been organized on the basis of either the type of company or the type of test problem because it was believed that a random order would best illustrate the wide and varied use of the tests.

### Specific Industrial Test Usage and Research

A few of the many studies which have been conducted will be reported rather completely to illustrate the systematic discipline required in the use of tests for industrial purposes. None of these studies are to be regarded as illustrating an ideal testing situation; they were made in the best way possible in view of the limitations imposed by the particular industrial situation.

A study on the use of dexterity tests to select watch factory workers was conducted by Blum (*1*). The first step in the research called for job analysis of the different types of work performed in the factory. This brought to light the following important job requirements: fine finger movements, the manipulation of tweezers, and the ability to continue doing delicate and sometimes intricate tasks over long periods of time without any increase in tension or maladjustment.

A review of the available test material indicated that, in view of the factory's requirement of a brief testing period, the Johnson O'Connor finger dexterity and tweezer dexterity test would probably be best. Prior to embarking on the testing program, however, the various available criteria of success were surveyed, and three measures were obtained: length of employment, salary ratio, and foremen's ratings.

The length of employment criterion was divided into four categories. The first was the "less than one week" group. The majority of employees in this category left or were dismissed within one week because of poor ability for the job. From the point of view of this criterion, this group was the poorest. The second category was the "one week to four months" group. Management believed that the job could be learned adequately within four months.

Those who could not learn it in this time either were dismissed or resigned. From management's point of view, such an employee was inefficient; according to the employee, he could not earn enough. In any event, the employment relation was severed. The third category was the "four months to one year" group. These employees were regarded by management as moderately successful. The fourth category was the "one year or longer group." These employees were considered to be most successful; the training costs for them were lowest and the group had the highest production.

The second criterion was salary ratio. Since all employees were on a piece-rate system, earnings were a direct reflection of production. The figure used was the average of the weekly earnings over a three-month period. This time was considered long enough to average out minor peaks or slacks in business and minor difficulties in production. The actual criterion was expressed in the form of an index, with $x$ dollars earnings per week equal to a base of 100.

The third criterion was the rating of employees by the foremen. Each foreman was asked to give an overall rating on the basis of his opinion of the employee's usefulness and efficiency. In accordance with this rat-

ing, each employee was classified as excellent, good, average, poor, or unsatisfactory.

Five measures of test performance were established. Two were based upon speed, the total time required to do each test.

Another measure was the rating of the subject's qualitative performance on each test. Since this adds meaning to any objective score such as total time or items completed, it will be described in detail in the hope of encouraging the use of such a measuring technique. The qualitative rating is the examiner's overall estimate of the test performance. It includes how well the subject follows directions, tension during the test, and the method used in doing it. The following scale was used:

Rating Scale for Quality of Performance

| | Good | Average | Poor |
|---|---|---|---|
| Accuracy of selection | | | |
| Grasp of pins | | | |
| Positioning of pins | | | |
| Placing of pins | | | |
| Hand tremor | | | |
| Condition of board | | | |
| Pace | | | |
| Position and movements of arm | | | |
| Body posture | | | |

The fact that there is an appreciable distribution in qualitative performance ratings is illustrated by the findings in this particular study; they are presented in Table 11.1.

**Table 11.1. Distribution of Quality Ratings on Finger and Tweezer Dexterity Tests**

| | Finger Dexterity Test | | Tweezer Dexterity Test | |
|---|---|---|---|---|
| Quality Ratings | Employees in Watch Factory | Applicants for Factory Jobs | Employees in Watch Factory | Applicants for Factory Jobs |
| Total number of individuals | 163 | 420 | 143 | 420 |
| 1.—Excellent | 5.0% | 3.6% | 13.3% | 5.9% |
| 2.—Good | 44.1% | 39.2% | 55.9% | 50.1% |
| 3.—Average | 48.5% | 50.9% | 28.0% | 36.3% |
| 4.—Poor | 2.4% | 5.8% | 2.8% | 7.1% |
| 5.—Unsatisfactory | 0.0% | 0.2% | 0.0% | 0.5% |

This measure of test performance results in an overall rating by the examiner of the subject's manner during the test. Most performance tests and many pencil and paper tests readily lend themselves to such a rating. These ratings are useful in considering a person for hiring.

The fifth measure was a comparison of the time taken to do the second half of the finger dexterity test and the time taken on the first half. It was assumed that the difference between the total time on each half might measure ability to improve the rate of speed and might therefore be useful as an indicator of rate of improvement on the job.

In this study, 258 subjects were used. Of this number, 137 were tested subjects, 84 who were referred without testing constituted a control group, and 37 were used in the pilot study which preceded the major study; this last group was also considered a "follow-up" group.

All testing was done under favorable environmental conditions, that is, in a testing room; and all the subjects knew that they were taking a test to be used by a specific watch factory for hiring purposes.

The data were intensively analyzed in three ways. First, the characteristics of the various criteria, as well as their interrelations, were studied. Second, the characteristics of the various indicators and their interrelatons were studied. Third, the relation between the criteria of success and the test results was analyzed; this was the crucial step.

The correlations among the criteria indicated that each was measuring a relatively different aspect of success on the job. For example, the correlation between foremen's rating and salary ratio was +.13. The correlation between length of employment and foremen's rating was +.25. The correlation between salary ratio and length of employment was highest, +.44.

Four of the five measures of test performance—the time scores and qualitative performance on both tests—were established as reliable; but one measure, improvement, was not established as reliable. Comparing each intercorrelation of each of the five measures showed that all were low. Eight were less than +.20 and one was only slightly higher. The only high intercorrelation was that between quality rating and total time of the tweezer dexterity test; this was +.71. However, quality ratings generally cannot be considered to be intimately related to speed because the correlation between the quality rating on the finger dexterity test and the total time on that test was only +.13. Low correlations among test measures and low intercorrelations among job criteria are actually more favorable than high intercorrelations. When such correlations are high,

their predictive value is limited since all will be predicting the same thing. By the same token, if all the job criteria are highly intercorrelated, they will all be measuring the same thing instead of different aspects of success. The total time score on the finger and tweezer dexterity test generally had the highest prediction value of the job success criteria. Quality ratings on test performance were valuable for prediction in some instances, but improvement on the second half of the finger dexterity test was not predictive for any of the criteria. Some of the specific findings are as follows (*1*):

Quality ratings during testing for finger dexterity were not indicative of length of employment. But those with "average or below" ratings on the tweezer dexterity test were found in the shorter categories of employment. Sixty-one per cent of the group who received such ratings were no longer employed after four months and only 27 per cent of those who received "above average" ratings left or were dismissed within this period. The difference was statistically reliable and $D/\sigma$ diff. was 3.6. When the quality ratings for both tests were combined and distributed according to length of employment, no statistically reliable differences existed between those rated high and rated low in test performances.

Low correlations were reported between the quality ratings on either dexterity test and salary ratios. The correlations were $+.17 \pm .11$ for the finger dexterity test and salary ratios, $+.15 \pm .11$ for the tweezer dexterity test and salary ratios, and $+.05 \pm .12$ for the combined quality ratings and salary ratios.

Quality ratings on the finger test were related to foremen's ratings of job performance with a coefficient of contingency of +.50. The C for tweezer quality ratings and foremen's ratings was +.24. A coefficient of contingency of +.30 was obtained when foremen's ratings were correlated with the combined quality ratings on both tests. (Maximum $C = +.86$.)

Improvement on the second half of the finger dexterity test was not predictive of length of employment.

Improvement correlated with salary ratio $-.06 \pm .13$. This is the only comparison of the entire investigation that shows a negative though unreliable relationship between test indicators and the criteria of proficiency.

Of the workers who received "A" ratings by foremen, 100 per cent showed improvement on the second half of the finger dexterity test. Of the workers who received "D" ratings, only 50 per cent improved. Eighty-four per cent of those who received "B" ratings improved and 61 per cent of those who received "C" ratings improved. The difference in per cent between those who received "A" and "D" ratings is not statistically reliable, possibly because of the limited number of subjects.

Time scores on both the finger and tweezer dexterity tests were faster on the average as length of employment increased. The $D/\sigma$ diff. for the average time on finger dexterity test between the "less than 7 day" and the "more than 1 year" groups was 4.3. In the same comparison on the tweezer dexterity test the

$D/\sigma$ diff. was 2.5. Combining the finger and tweezer dexterity time scores did not increase the statistical reliability of the difference, and $D/\sigma$ diff. between the "less than 7 day" and "more than 1 year" groups was 2.3.

The correlation between finger dexterity time score and salary ratio was $+.26 \pm .10$; between tweezer dexterity time score and salary ratio it was $+.32 \pm .10$; and between the combined test times and the salary ratio it was $+.39 \pm .09$.

The "above average" group according to foremen's ratings was 5 seconds faster on the finger dexterity test and 9 seconds faster on the tweezer dexterity test than the "average and below" group. The difference for the combined test scores between the two groups was 12 seconds in favor of those receiving above average ratings. These differences were not statistically reliable.

The practical value of the critical scores (time score of 5′30″ or better on the tweezer dexterity test and 7′30″ on the finger dexterity test) which were suggested in the pilot study (7) is clearly indicated in this investigation. These scores discriminate employees in the watch factory with a considerable degree of exactness according to the criteria of proficiency. This will be indicated in the following summary.

A comparison according to length of employment showed that 7 per cent of the group that "passed both tests" left within one week, whereas 23 per cent of the "no test" group and 24 per cent of the group of workers who "failed either or both tests" were unemployed after one week. The differences in the percentages between the first and the last two were statistically significant with critical ratios of 3.2 and 3.4 The greatest possibility of prolonged employment was found in the group that "passed both tests." Of this group, 72 per cent remained four months or longer. This percentage was significantly different from that of the "no test" group ($D/\sigma$ diff. of 3.1), and from that of the group which "failed either or both tests" ($D/\sigma$ diff. of 4+).

A comparison according to salary ratios indicated that the group that "passed both tests" earned the most money. The earnings of this group were statistically different from the earnings of the group that "failed one or both tests," with a $D/\sigma$ diff. of 5. The "no test" group was superior in salary ratio to the group that "failed either or both tests," with a $D/\sigma$ diff. of 3.5. The group that "passed both tests" was superior to the "no test" group but the $D/\sigma$ diff. was only .9.

A comparison according to foremen's ratings showed only a trend. The group that "passed both tests" was rated by foremen as "better than average" in 34 per cent of the cases. The group that "failed either or both tests" was rated as "above average" in 25 per cent of the cases. This difference was not statistically reliable. The $D/\sigma$ diff. was .9. No differentiation between the "no test" group and the "passed both tests" group is possible according to foremen's ratings.

A follow-up of the subjects in the pilot study supports the findings of the present investigation that time scores on the tests are indicators of proficiency. Two years prior to the "follow-up" 20 workers were selected by foremen as superior and 17 as mediocre workers in the watch factory. These groups were originally differentiated in test scores with a critical ratio of the difference of 2.18 for the finger test and of 1.01 for the tweezer test. The size of the groups,

of course, affected the significance of their differences. The $D/\sigma$ diff. for the percentage discharged, which was the difference between 0 and 18 per cent, was 2. The $D/\sigma$ diff. for the salary ratio was 3.7.

Before presenting a review of other studies, it is desirable to take stock and consider the implications of such research. The above study was not an "ideal" study. Because of factory conditions, it was impossible to use desirable scientific controls. For example, equal-sized groups in the various categories could have been arranged for in a laboratory more readily than in the factory. The demands of research must often conform to conditions in the factory, but only as far as planning and methodology are concerned. The statement does not hold for research conclusions, for these must be reported independently of plant conditions and must conform very strictly to the data obtained.

The industrial psychologist is justified in conducting laboratory studies only as a preliminary to the research in which the industrial situation necessarily becomes the "laboratory." Laboratory conclusions cannot be generalized and applied to the industrial scene without checking them in every way possible. Whether the problem involves tests for selection or any other purpose, the industrial psychologist often has to modify procedures and attack it in a manner that is unorthodox from the scientific point of view. If, for example, he will not forsake rigid controls in some cases, he may be forced to give up the entire problem. To the industrial psychologist, the lesser of the two evils is to conduct research in industry under the best conditions that industry can provide.

A further illustration of this point concerns desirability of having large numbers of subjects for an experiment. However, an industrial organization is often not in a position to hire on a large scale. In this case it is better to sacrifice the number of subjects rather than the entire study.

This principle does not imply that a form of research euphemistically called "directed research" should be tolerated. Research reports must agree with the conclusions based upon the facts obtained. An industrial psychologist who does not report negative findings because this would create disrespect and might lead to his dismissal is as wrong as the business executive who wants the research to back up his sales ideas and therefore "directs" the research and its findings. After all, the monumental contribution made by the Hawthorne Studies could not have been possible had the research program not been flexible and sincere and had the findings been reported otherwise than as they occurred.

The points just discussed are important and should serve as a means of

evaluating not only test research but all other types of research in the field. To this end, a few additional studies on test selection will be described.

In his study of tests for selecting inspector-packers (*11*), Ghiselli used a battery of several tests on a group of 26 women employees working as inspector-packers in a pharmaceutical concern. There were five main duties in this job: filling containers, inserting stoppers, examining the contents by eye, labeling the containers, and packaging. The job, although routine, is extremely important, for the presence of extraneous material or incorrect labeling might result in serious illness or even death for anyone who happened to be sold the wrong product. The criterion of job efficiency was the combination of ratings by the forelady and the supervisor.

The job analysis indicated that the important abilities that should be measured in the preliminary battery of tests were:

1. Dexterity of fingers, hands, and arms.
2. Eye-hand coördination.
3. Estimation of the size and form of objects.
4. Ability to observe difference in details.

To this end a battery of six tests was administered to the employees. It was found that the average performance of the inspector-packers on these tests was vastly superior to that of samples of an adult population in the Minnesota Placing and Turning tests and the Paper Form Board test. Although this information is useful, selection is justified only when a relationship is found to exist between test performance and job performance. Such a relationship is called a validity coefficient. The Minnesota Paper Form Board test was found to be more closely correlated with the criterion than any other test in the battery; this test correlated to the extent of +.57. The Peg Board test correlated with the criterion to the extent of −.50, and the Turning test to the extent of −.40. The other tests had lower correlations with the criterion.

This study, like the one previously reported, has shortcomings. The criterion of proficiency was a rating by superiors; but, since it apparently was the only criterion available, it had to be used or no tests could have been given. Too often in industry such ratings comprise the only available criterion. The number of subjects, 26, is small; but when we remember that this constitutes a large number of people performing the same task, it can be considered a satisfactory sample. The study presents no evidence

on the success of its recommendations that were adopted for future use; such information, as well as recommended critical scores, is often helpful in evaluating the use of tests.

Edwin N. Hay (*14*), using a battery of tests, was able to predict 91 percent of the better bookkeeping machine operators and 72 percent of the less satisfactory operators. Prior to establishing these results, all the procedures involved in test research and development were followed. These included job analyses, establishment of adequate job criteria, preliminary selection of the test battery, and statistical investigations. Only after many years was it possible to recommend the particular test battery as successful for prediction purposes.

The job analysis revealed that the outstanding requirement for machine bookkeeping is bimanual ability. A detailed time and motion job analysis showed that there were five distinct operations which could be broken up into 18 motions. The average time for the five operations—selecting ledger card, inserting ledger card, picking up previous balance, post-checking amount, and returning card—was 6.8 seconds. In most of these operations the eyes and both hands are used. Speed and accuracy are required for the successful performance of this job. The difference between the ability of the best and the ability of the poorest operators is greater than 2 to 1; that is, the best operators do more than twice the work done by the poorest operators.

The tests used included the Otis Intelligence test, the Minnesota Clerical test, the Ziegler Rate of Manipulation tests, and other tests of clerical ability such as filing and name finding. In all, 22 tests were administered. Although six of them were of the hand, arm, and finger dexterity variety, none of these six showed any considerable relationship with the criterion "speed of posting." However, the Otis test, the Minnesota Clerical Test-Numbers, and the Alpha Number series correlated +.50 or higher with this criterion. The multiple correlation technique indicated that the Otis test and the Minnesota Clerical had a correlation of +.65 with the criterion. The higest multiple correlation between the test battery and the criterion was +.71 and included the Otis, the Minnesota Numbers, the Alpha Number series, and the Fryer Name Finding.

Hay's study is valuable from many points of view. The evidence presented in the follow-up indicates that in this case the tests worked. Table 11.2 shows the steady improvement in the average production of bookkeepers since selection based on testing was introduced.

A. Q. Sartain (*17*) administered a battery of seven tests to a group of

Table 11.2. Average Production of Test-Selected Bookkeepers

| Date | Number | Average Production |
|---|---|---|
| October, 1937 | 43 | 105.0 |
| November, 1939 | 40 | 108.7 |
| April, 1940 | 30 | 109.7 |
| December, 1940 | 32 | 110.2 |
| December, 1941 | 26 | 110.9 |

47 employees in the inspection department of an aircraft factory. The criterion was set by the ratings of the instructors in a refresher course being given to inspectors. The instructors were also familiar with the performance of these employees and their ratings undoubtedly reflected this knowledge. The test battery included the MacQuarrie, the Otis, the Cardall Test of Practical Judgment, the Minnesota Paper Form Board, the Industrial Classification Training test, the Bennett Test of Mechanical Comprehension, and the O'Rourke Test of Mechanical Aptitude. The multiple correlation of this entire battery with the criterion was +.787. However, three of the tests—the MacQuarrie, the Cardall, and the Minnesota Paper Form Board—yielded results equally good, the multiple correlation being +.780. Since the difference between these two correlations is negligible, it would be advisable to use these three tests, rather than all seven.

John T. Shuman (*18*) administered a battery of tests to a group of employees and applicants for various jobs at the Lycoming Division of the Aviation Corp. The tests included the Otis, the Minnesota Paper Form Board, the Bennett Test of Mechanical Comprehension, the O'Rourke Test of Mechanical Aptitude, and the Minnesota Vocational Test for Clerical Workers. The employees tested included inspectors, engine testers, machine operators, foremen, and job setters, among others. Shuman reports that the average improvement in selecting excellent workers was 18 percent with the Bennett test, 15 percent with the Otis, and 13 percent with the Minnesota Paper Form Board. The critical scores that made this improvement possible meant the elimination of one out of every four persons tested.

The Bennett test when compared with the criterion (ratings) was found to be highly correlated to the job of job setter, the correlation being +.73. The Minnesota Paper Form Board correlated +.59 with this same job. The Otis test had the highest correlation with the job of engine tester,

+.57. Shuman finds that the tests in his battery correlate better with jobs that require skills such as working on machinery precision parts or testing aircraft engines, rather than purely manual skills. He believes that tests can be more useful in assigning employees to job category levels than to specific jobs. An incidental finding, but one that deserves mention, is the fact that one test had to be dropped because of dissatisfaction on the part of the subjects. This was the O'Rourke Test of Mechanical Ability, which was too long and proved to be almost useless with women applicants, many of whom did not even try to take it. This emphasizes that a test battery must be favorably received by the subjects if any value is to be attached to the results.

Many other studies have been as effective as the few described above. However, further examples would only labor the point. The use of psychological tests in industry demands research and development in the light of the particular problem and the specific plant. The fact that this work has been done before does not make it unnecessary; it means that the chances of success are improved each time. The essential point is that test results must be correlated with job success; they can never be taken for granted.

Industrial testing requires a battery that is, first of all, brief. For the average factory and office job, a short intelligence test supplemented by one or two pencil and paper or performance tests is the usual procedure, and under adequate conditions it can be moderately successful in prediction.

Tests measuring personality characteristics or adjustment for industrial selection purposes are conspicuously absent from the test batteries now in use. There is one exception, however, and this is the work done in the selection of salesmen. Since this will be described in Chapter 20, it is omitted for the present.

Doncaster G. Humm advances the view that aptitude tests fit the worker to his job but not to his fellow workers. He believes that temperament testing is essential as a supplement to aptitude testing, and is enthusiastic over the industrial possibilities of the Humm-Wadsworth Temperament Scale. This test is an interesting variation of the inventory type of questonnaire with a slight clinical slant. It is probably not as bad as some people in the field claim, but no substantial evidence that it is much better than most tests of this type has come to light.

An interesting approach to the problem of the validation of personality testing in industry is afforded by work done by Martin. He and Guilford

constructed the Guilford-Martin Personnel Inventory and they have attempted to validate it by administering it to people employed in industry. Martin claims that troublemakers can be located through the use of this inventory (*16*). Three traits are measured: coöperativeness as opposed to faultfinding; objectivity as opposed to personal reference; and agreeableness as opposed to belligerence.

Two hundred questionnaire items were constructed to cover the area of behavior believed to be connected with these traits, and the questionnaires were then administered to 500 men and women holding a great variety of jobs. Typical items in the questionnaire are as follows:

For Trait Co:
- Do you believe that most people shirk their duties whenever they can without appearing to do so?
- Do you feel that many young people get ahead today because they have "pull"?

For Trait Ob:
- Are you continually comparing yourself with other people?
- Do people near you sometimes whisper, or look knowingly at one another when they think you are not noticing them?

For Trait Ag:
- Do you believe that most people require someone to tell them what to do?
- Have you very much resented having friends, or members of your family, give you orders?

The questions were subjected to an item analysis and a weighted scoring system was devised. Two experiments were then conducted to establish the validity of the questionnaire. In one, the questionnaire was administered to a group of 51 employees of a California aircraft corporation. Here the test classified as having "undesirable temperaments" 82 percent of the workers who, in management's opinion, had proved to be troublemakers or "soreheads." Only 38 percent of the satisfactory workers were classified in the "undesirable" group.

In the second validating experiment, the questionnaire was given to 43 workers in a New York textile concern. Thirty of this group were well adjusted and 13 were rated as malcontents. Eleven of the latter (85 percent) scored in the 40th percentile or lower, based on the sample of 500 workers on the coöperative trait. However, 11 of the 30 well-adjusted workers (36 percent) also were in this percentile category on the Co trait. Martin does not mention any results with the two other traits, so there is no way of knowing if they were valid to the same extent as the coöperative trait appears to be.

The questions in this personnel inventory, however, are of the type which employees can "fake" if they wish to; one wonders why employees answer these items on the basis of "the way they are," instead of the way they know "they ought to be." The test should be watched with interest, although it cannot at present be regarded as infallibly predicting troublemakers. The interesting point is the attempt to validate a personality test on people employed in industry. More of this work should be encouraged, for eventually someone will find the right answer to the problem.

Ghiselli and Barthol (*12*) reviewed 113 studies dealing with the validity of personality inventories in employee selection. Their results are summarized in Table 11.3. They conclude that under certain circumstances

Table 11.3. Weighted Mean Validity Coefficients of Personality Inventories for Various Occupational Groups (*12*)

| Mean r | Total Number of Cases | Total Number of r's | Occupation |
|---|---|---|---|
| .14 | 518 | 8 | General supervisors |
| .18 | 6433 | 44 | Foremen |
| .25 | 1069 | 22 | Clerks |
| .36 | 1120 | 8 | Sales clerks |
| .36 | 927 | 12 | Salesmen |
| .24 | 536 | 5 | Protective workers |
| .16 | 385 | 6 | Service workers |
| .29 | 511 | 8 | Trade and crafts |



scores on personality inventories correlate better with proficiency on a wider variety of jobs than might have been expected.

A highly controversial test is the Activity Vector Analysis. According to W. V. Clarke, it is used in over 100 companies in business and industry (*8*). The test consists of a sheet containing 81 descriptive words. The respondent "places an x (in column 1) before every word that has ever been used by anyone in describing you." In column 2 the respondent "places an x opposite every word which you honestly believe is descriptive of you." This results in a scoring of four vectors—aggressiveness, sociability, amiability, and avoidance—and overall score or activity level. The novelty is that it is claimed that after only 10 days of training any person who is a college graduate and has had five years of industrial ex-

perience can become an analyst. It is inferred that such a person can then select employees within the total range of the occupational world.

To date, no such simple and direct technique has withstood the ultimate validation. Much research is needed on this test and by independent and qualified psychologists before the final answer can be known. In the meantime one can expect enthusiasm from the author, his associates, and his analysts.

While this test or system of evaluation may be the short cut all would like, it remains to be proved. Only a short while ago dianetics swept the country. It now seems to be as vaguely remembered as chlorophyll. Naturally, one must expect innovations and one should neither completely dismiss a proposal without careful examination nor immediately become a cultist. With reference to the AVA the proof will have to be forthcoming.

A chapter on the use of psychological tests in industry would be incomplete without reference to the considerable work done by the United States Employment Service. Some state employment services send to employers, without any charge, applicants who have been given psychological tests. Of course, in many instances the testing is not tailor-made to the requirements of a particular company and this may prove a disadvantage. But, desirable as it is to have the testing program fit the specific needs of a specific company, it must be recognized that many firms may not wish to spend money on psychological testing. Under such circumstances, the facilities offered by public agencies may be more beneficial than detrimental, provided some check on the usefulness of the test in the specific company is made.

A battery of tests known as the General Aptitude Test Battery has been made available to the various state employment services by the United States Employment Service (*13*). It consists of eight pencil and paper tests and four apparatus tests. The twelve tests measure nine of the aptitudes that are often related to the requirements in the performance of jobs. Table 11.4 presents the test names and the aptitudes measured.

The General Aptitude Test Battery is intended to be used in two ways:

1. As an integral part of counseling where a measure is needed of the applicant's abilities in relation to the various fields of work in which he may have interest but no practical experience.
2. As an approach to the problem of developing specific batteries for the countless occupations for which selection tests may be needed. Those

tests in the General Aptitude Test Battery which measure abilities significant to the successful performance of a given job can be administered as a specific aptitude test battery, and the other tests omitted.

Table 11.4. Aptitudes Measured by Tests in the GATB

| Aptitude | Test Name | Test Number |
|---|---|---|
| Intelligence (G) | Three Dimensional Space | 3 |
| | Vocabulary | 4 |
| | Arithmetic Reason | 6 |
| Verbal aptitude (V) | Vocabulary | 4 |
| Numerical aptitude (N) | Computation | 2 |
| | Arithmetic Reason | 6 |
| Spacial aptitude (S) | Three Dimensional Space | 3 |
| Form perception (P) | Tool Matching | 5 |
| | Form Matching | 7 |
| Clerical perception (Q) | Name Comparison | 1 |
| Motor coördination (K) | Mark Making | 8 |
| Finger dexterity (F) | Assemble | 11 |
| | Disassemble | 12 |
| Manual dexterity (M) | Place | 9 |
| | Turn | 10 |

According to the guide in the use of the GATB, certain of the tests and their cut-off or minimum scores are recommended for use in the selection of applicants for a wide variety of occupations. For example, the job of all-round mechanical repairing would include testing for G, N, S, F. Computing work requires tests for N, Q, K, F. Plumbing would include tests for N, S, M. Typewriting requires V, Q, K, F.

The battery has been administered to a very large number of persons employed in a wide range of occupations. Over 500 employers and many vocational schools and colleges have coöperated in the development of occupational norms. It is obvious that problems of establishing reliability, validity, and norms for a test battery such as this with its intended wide coverage of so many occupations are stupendous if not insurmountable.

We were rather critical of this battery in a review in Buros' *Fourth Mental Measurements Yearbook* (6). Since that time (no cause and effect relation implied) additional data, conferences, and published material have tended to improve the situation somewhat. The GATB has promise but much additional work is needed.

### Crystallizing the Major Problems Related to Testing for Selection

The promiscuous use of tests is likely to lead to much less than satisfactory results when evaluation of the process occurs. To avoid failure, one must first define the problem and then determine the likelihood that the use of tests can be effective. Hiring inexperienced applicants is quite different from hiring experienced applicants. Establishing that the test battery works in one of these situations does not mean that it will work in the other. In fact, it is usually safer to predict that it may not.

Even when testing the aptitude of an inexperienced applicant or the ability of the experienced candidate is thorough and comprehensive, the job is never complete. It is safe to assume that the ability or aptitude necessary to successfully perform an occupation is less of a factor than the personality and motivation variables involved.

Further, some tests measure general characteristics that may be conducive to learning, and others measure specifics that may or may not be related to job performance. A decision in selecting tests has to be related to the type of problem posed in policy of hiring in the specific firm. Such items as age, sex, and educational level are never inconsequential and may be conducive to success in one situation but failure in another.

Possibly the most important consideration is to determine, Why test at all? One must clearly differentiate between testing out of curiosity, testing because it is fashionable, and testing with a purpose. Whenever it is the latter, we must know something about validation—that is, what relation exists between performance on the test and performance on the job. Further, one should never pass over lightly the rigid meaning of performance on the job. A comprehensive and overall measure will usually be more meaningful than any single criterion.

It is entirely desirable to test for description, but one must clearly differentiate between description and prediction. It is justifiable to administer a test to a person and describe the degree of the aptitude, ability, or characteristic he possesses. However, the amount or degree required for successful performance cannot be assumed. It must be established.

A person's intelligence, interests, or other characteristics can be de-

scribed as high, low, or whatever the degree. An employer may rightly or wrongly specify that he wants the one with the highest intelligence. While the psychologist can describe the degree possessed, he must inform the employer that it does not follow that the person with the most intelligence will be most successful. Along the same line a psychologist can, as a result of tests, describe a person as energetic and even ambitious. However, the job may be such that an unambitious person is likely to stay with it longer. If length of tenure is the measure of success, then the least ambitious might be the better employment risk even though the other is a "better" trait. Tests must be differentiated as to whether they are describers or predictors. Each has its usefulness but should not be confused with the other.

One further point: It is never safe to assume that one can expect a linear relationship to exist between performance on a test and performance on a job. It may well be that possession of a characteristic up to a degree is related to performance and beyond that point the relationship may disappear. Many have already established that a U type of relationship exists between intelligence and job criterion. That is, low and high scores go with high turnover and some middle range of scores is related to least turnover. Brown and Ghiselli (*4*) have established that a similar situation exists when tests quite different from intelligence tests and turnover of taxicab drivers are compared.

### The Use of Tests in the Selection and Promotion of Executives

The trend in business and industry has been toward recognition that the industrial psychologist is well qualified to aid management in the evaluation and selection of potential executives. Many consulting firms are finding that this activity occupies more and more of their time. The writer now devotes a major share of his consulting to this work.

As in all new developments, misunderstanding is widespread and the "gold brick" salesman has a holiday. The psychologist can be helpful provided management understands that no one has a secret formula, a magic selector, or a panacea. The short cut is not possible, at least at the present stage of development.

The writer (*2*) recently attended a management development meeting at which three staff members of a utility company presented a report on the wonders of a technique they were using to select a wide range of employees from clerical to executive level. They seriously believed that they had the psychological counterpart of the wonder drugs in medicine.

However, what they had was no moldy substance; it was a test administered in five minutes and scored in about the same time. They claimed it resulted in a "know it all, tell it all" possibility. In addition to the three staff members who glowingly reported the value of their work, a vice-president sat silently but smilingly on the side, enthusiastically nodding on the wonders of his staff.

The few psychologists in the audience were amazed. Psychologists generally agree that they cannot validly assess and evaluate a phenomenon as complex as a human being within five minutes. How is such a thing possible? If this had been a matter of tea leaves, very few would have taken it seriously; but since this was a more substantial claim, it simply could not be dismissed without some mental gymnastics. After some deliberation, two tentative explanations were proposed. The first is that many people like to play psychologist and do not have the time to acquire the information through normal and regular channels—that is, graduate schools. The other reason is a little more practical. After all, these people should be expected to defend their position very strongly. If the system used should prove to be nonsense, it goes without saying, they would be fired. It is likely that, in addition to being enthusiastic, they wanted to keep their jobs.

The selection and evaluation of executives is a serious matter and while psychologists cannot claim always to provide perfect answers (many times there is no perfect answer) they can help to eliminate some of the elements of risk.

Although the use of psychologists and psychological techniques in the selection and evaluation of executives is not widespread, it is on the verge of becoming "fashionable." The decision to use a psychologist should not rest on "keeping up with the Joneses"; it should depend on a real problem in need of a solution. Let us recognize that this is not a fad or a game.

What is worth doing is worth doing correctly. The executive who desires to use psychological techniques to help select employees should attempt to estimate the nature of his problems and also be given estimates of the likelihood that the techniques used will help in offering solutions.

Management must assess its needs before embarking on a recruitment program for future top management people. The simplest way to do this is to take a look at the organization chart and estimate growth needs, then fill in the names and ages of the people occupying the present posi-

tions and estimate the moves that are likely to be made within a 10-year period. This procedure points to the future needs for engineers, controllers, research and development people, and others. It can also help to estimate the numbers that will be needed, and so the task of the recruiter becomes more specific and meaningful. If present staffing is not likely to fulfill the needs, one must go outside the company.

The decision to hire must be made and there are at least three ways of doing this. Either top management makes its own selections, it empowers personnel to do the hiring, or an outside consulting organization receives the assignment. If top management is to spend the time necessary, then other aspects of management tend to be delayed or postponed, or to suffer otherwise. While it is axiomatic that top management should be involved in the final decision, it does appear that the details of evaluation should be left to people with more time and also more training in the area. Whether the personnel department does this work depends upon the professional level of staff operation. In many companies personnel departments have very few, if any, staff psychologists. Admittedly, it is not necessary for all people in personnel departments to be psychologists because of the wide variety of duties and assignments. However, evaluation of potential executives should be the work primarily of psychologists. If personnel departments are not so geared, then the most economical practice is to call in the consultant.

It is well to remember that the professional psychologist working in the area of selection and evaluation of executives has no secret formula. He selects his instruments from a variety of psychological tests and interview techniques that are most helpful in enabling him to draw certain conclusions. He is likely to select one or more intelligence tests, interest tests, personality tests, and so on. In addition, he will use one or more interview techniques as a means of gathering data. He is likely to be more accurate when he uses the services of a team of psychologists who gather independent data and then check the data against the hypotheses.

It is important for the psychologist to differentiate between describing the degree of the characteristic possessed by the man and predicting future behavior. If his measures are accurate his descriptions are accordingly accurate. In the realm of prediction he is on less substantial ground. His predictions may be accurate provided he has adequate description of behavior and provided he knows the characteristics necessary to perform the executive duties.

This, of course, means that the psychologist has need for a criterion

of success. Management must furnish this either in the form of ratings of success or in their description of the kind of person that is needed. For example, as a result of acquiring data about an individual the psychologist can describe him as being accurate, energetic, serious, and superior in intelligence. Further, he can describe the degree to which these traits are possessed. Predicting whether this combination will be successful depends entirely upon the characteristics required in the performance of the executive duties. If management insists that a person be creative, highly imaginative, and excessively ambitious, then the previous description does not allow for the prediction. If management would rather have a person who will work accurately at all costs, the previous description could allow for a prediction of success.

In the evaluation of an executive, it is important for a psychologist to recognize that he is not playing a management role whether he is on the staff of the company or is employed as a consultant. He must limit his role to furnishing information to management that will enable it to decide. Experience has indicated that the awareness that psychologists are not management people is desirable. Likewise, management people are not psychologists. In other words, psychologists can furnish descriptions of an individual, management must offer a criterion, and together they can decide the likelihood that this person meets the criterion stated. Ultimately, the decision to hire or promote must be management's and not the psychologist's.

If the reader will think of the controller, the president, the chief engineer of different companies, he must immediately reach the conclusion that different people with the same titles can apparently be equally successful. In other words, there is no particular degree of intelligence that is required of a president. He may or may not be the most intelligent executive on the staff. By the same token, one president may be shy and retiring and another may be a glamorous dynamo. This leads to the known fact that the characteristics required on a job are very often determined by the philosophy of management.

Unless management has made incredible and preposterous decisions, it is the task of the psychologist merely to describe the characteristics of a person that will enable management to get a better estimate of whether or not he will fit. The advantage of the psychologist's description is that he is not emotionally involved, as sometimes different executives in a company are. His description can reduce the margin of error considerably. It can definitely provide management with additional in-

formation that will make it possible to develop the candidate's potential over a period of years. It can also provide the candidate with additional insights that, in turn, will help him to change, grow, and reach his potential.

A certain amount of success and considerable enthusiasm has been attained in a testing program instituted by one large management consulting firm. Briefly, the approach requires the candidate to spend approximately two days taking tests and being interviewed. Some of the tests are individually administered and are of the projective technique type; that is, they are not structured to have absolute and correct answers, but the answers given are definitely a reflection of the individual involved. To be sure, considerable skill is required if interpretations of these data are to be meaningful and accurate. At least two levels of intelligence tests are given. One is rather simple and short; the other is of the power type that tests the limits of the individual. Personality tests of two varieties are given. In one kind, the person answers questions directly and can be pretty much the way he either wants to be or thinks he is. These results are then checked with test results that are not too easy to "fix." The comparison of the two measures indicates to a certain extent the degree of self-insight. For example, the person who is impulsive may or may not recognize this trait in himself. If he does, then changes are possible. If he does not, the problem is of a different order.

In addition to a lengthy battery of tests, three types of interview situations are used. One requires that the person talk about himself at length. The interviewer says very little and makes copious notes about what the person is saying, adding his own judgments about the kind of person he is. These judgments are not regarded as fact but are considered hypotheses and checked against other data independently gathered. Another type of interview used is the "leaderless group conference." If there are five candidates for a job, these five are brought together, given a topic, and asked to pay no attention to the observers while holding the conference. Three psychologists sitting on the side lines observe the interaction of the candidates during such a conference. The third form of interview used is the panel technique, in which three psychologists meet with the applicant. After discussing the usual social amenities, conversation is brought around to a number of situations and the role of the psychologist is to a large extent to disagree with the candidate. The way the person behaves under such circumstances allows for certain assumptions related to descriptions as well as predictions.

About the most important feature of the appraisal technique used by this management consulting firm is that a team of psychologists is always involved. Depending upon circumstances and costs, there are between three and six psychologists on the assigned team. Each is involved in different aspects of the data-gathering, and each is required to submit an independent report without knowing the data acquired by other sources. When hypotheses are in disagreement, data checks as well as conferences are held in order to clarify the picture. The final report is then written in nonpsychological language with division headings that are related to management performance. This report is submitted to top management only and a conference is held at the time with the team of psychologists present. Too many written reports tend to be easily misunderstood. The conference results in clarification. The conference is necessary and reports are never submitted unless a conference has been arranged.

Any new field of development must recognize that different procedures will be used. The writer favors the team approach in that it allows for psychologists to check their hypotheses. Since each gathers a set of independent data the possibility of contamination is held to a minimum. Other techniques include only interviews, only projective techniques, only inventories of a personality variety, or only one psychologist in the act from overture to finale. Still other techniques use combinations of the above-mentioned methods. This is a very promising field but again serious developmental work and exhausting evaluation are necessary before the acme of perfection is reached.

## Summary

Psychological testing in industry has been widespread. Valuable sources of information about its use may be found in the works of Brown, Buros, Jones, and Dorcus and Jones.

Many companies have used tests to select as well as promote employees. Although a complete list of companies employing psychological tests is not available, there are many references to specific companies in the literature.

Some studies have been rather fully described in this chapter, not because they represent "ideal" test use but to show the accepted and prescribed manner of introducing a test battery in industry and to demonstrate some of the legitimate limitations. Some of the research of Blum, Ghiselli, Hay, Sartain, and Shuman has been selected for this purpose.

The crux of the problem in industrial testing is the establishment of a relationship between test results and job performance which will make selection by tests better than the methods used previously.

Industrial test batteries must be brief. A short intelligence test and one or two pencil and paper or performance tests usually comprise the final test battery. Such batteries are usually given applicants for "run of the mine" jobs.

Personality testing, although important, has not been used widely in industry. This field will probably prove fruitful in the future. Martin's attempts to validate personality tests in industry are noteworthy and deserve serious consideration, even though his inventory is not much different from the many questionnaires and inventories now available. Short cuts tend to attract attention out of proportion to their present or even ultimate value.

The United States Employment Service has developed a General Aptitude Test Battery to measure aptitudes of applicants. The tailor-made test battery differs from the custom job. Its advantages are potentially multitudinous, but less enthusiasm and wish fulfillment and more hard work are necessary before the final answer will be known.

A clear-cut differentiation between testing for description and testing for prediction is desirable. In prediction, the criterion must be clearly established.

Psychological testing in the selection and evaluation of executives is gaining widespread attention. A technique in the evaluation of executives was described.

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CHAPTER 12

# Job Analysis and Evaluation

**A JOB** analysis is an accurate study of the various components of a job. It is concerned not only with an analysis of the duties and conditions of work but also with the individual qualifications of the worker. Whereas the industrial engineer is concerned primarily with the job aspects, the industrial psychologist tends to emphasize the man aspects of the job.

Studying the world of work makes it obvious that jobs are performed under vastly different temperatures, postures, and hazards, as well as innumerable other variations in work effort. Figures 12.1, 12.2, and 12.3 illustrate this.

Although it is true that different meanings are assigned to the terms job analysis, job specification, and job evaluation, for the practical purposes of the industrial psychologists these terms may be regarded as relatively similar.

### Uses and Value of Job Analysis

Lawshe and Satter (*18*) propose four major uses of job analysis: the derivation of training content, the setting up of personnel specifications, the improvement of job efficiency, and the establishment of wage structures.

After an intensive survey of 401 articles in the literature on job analysis, Zerga (*28*) concludes that there are approximately twenty uses for this type of information. He mentions the following specific uses:

1. Job grading and classification.
2. Wage setting and standardization.
3. Provision of hiring specifications.
4. Clarification of job duties and responsibilities.
5. Transfers and promotions.

*Figure 12.1.* Hazards in Work. *Top:* Be sure the pieces fit. *Bottom:* Rather cool for a catwalk. (Courtesy of Standard Oil Co. [N.J.].)
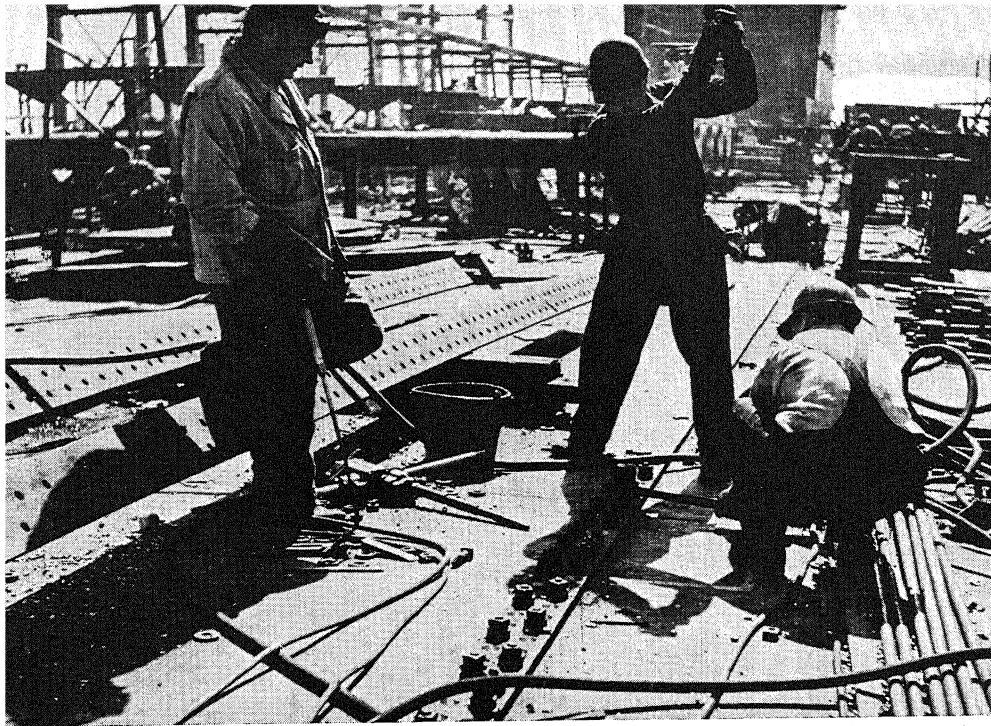
*Figure 12.2.* Detail in Work Can Differ. *Top:* A shipbuilder must watch detail. *Bottom:* A mapmaker must also watch detail. (Courtesy of Standard Oil Co. [N.J.].)

*Figure 12.3.* Men Are Needed for the Loading and Unloading of Supplies the World Over. *Top:* Work requires various postures. *Bottom:* The arrival of supplies results in a holiday from work for some and work for others. (Courtesy of Standard Oil Co. [N.J.].)

6. Adjustment of grievances.
7. Establishment of a common understanding between various levels of workers and management.
8. Defining and outlining promotional steps.
9. Investigating accidents.
10. Indicating faulty work procedures or duplication of effort.
11. Maintaining, operating, and adjusting machinery.
12. Time and motion studies.
13. Defining limits of authority.
14. Indicating cases of individual merit.
15. Indicating causes of personal failure.
16. Education and training.
17. Facilitating job placement.
18. Studies of health and fatigue.
19. Scientific guidance.
20. Determining jobs suitable for occupational therapy.

A careful examination of this list shows the great importance of having a job analysis made. Furthermore, this technique should not be regarded as being suitable only for large organizations. A good job analysis can be very important in easing much of the friction that often arises in the typical small office employing only a few girls. It is not unusual to find that in such an office the girls continually quarrel as to whose job it is to get the bills ready for mailing; everyone insists that she was not hired for that job and she sees no reason why it should fall on her. A frequent solution is to have the girls take turns, but this hardly ever helps because the girl who has to do this work on a particular day will accuse the other girls of refusing to help her. However, if there were clear-cut statements of specific requirements for the various jobs, such as a job analysis provides, much of this friction would be eliminated.

Another source of friction in offices is the lack of definite limits of authority. Thus a girl with seniority, even if it is only of two weeks, will attempt to assume authority over a new employee; the latter soon discovers that she has far too many bosses. Here again a job analysis is valuable.

In many respects, a job analysis is a vital part of working efficiency, besides promoting smooth working relationships among the employees. It can be regarded as the foundation upon which a system of efficiency is built. Effective training programs, good personnel policies, attempts to

reduce fatigue, and many other measures leading to efficiency cannot be introduced effectively unless the basic and preliminary step of job analysis has been taken. Prior to the development of psychological tests for industrial use, a job analysis must be made.

### Forms of Job Analyses

Different methods are used to obtain the data for a job analysis. In one method the job analyst observes the employee performing the job and writes up the results in any one of the acceptable forms. In another method the job analyst performs the operation himself and bases his written report on his analysis of his own activities. In a third method the job analyst interviews the worker in order to obtain the necessary information. In the fourth method photographic aids, such as stills and motion pictures, are used.

The best results in making a job analysis are usually obtained with a combination of various parts of all the methods just mentioned. The form used by the United States Employment Service, which incidentally has done a great deal of valuable work in this field, is presented in Figure 12.4.

A somewhat different form is suggested by Viteles' Guide to Job Analysis (*27*) which lists the following eleven items:

1. Identification of the job.
2. Number employed.
3. Statement of duties.
4. Machines used.
5. Analysis of operations.
6. Conditions of work.
7. Pay and nonfinancial incentives.
8. Relation to other allied jobs. (Place in the organization.)
9. Opportunities for transfer and promotion.
10. Time and nature of training.
11. Personal requirements:
    a. General (e.g., age, sex, nationality, marital status).
    b. Physical.
    c. Educational.
    d. Previous experience.
    e. General and special abilities.
    f. Temperamental and character requirements.

Another form includes the following major divisions:

1. Job name or title.
2. Classification title.

Form USES-546
(2-44)

U. S. DEPARTMENT OF LABOR
BUREAU OF EMPLOYMENT SECURITY
UNITED STATES EMPLOYMENT SERVICE

Budget Bureau No. 44-R577.2

# JOB ANALYSIS SCHEDULE

1. Job title ............................................ 2. Number ............................................

3. Number employed M .................. F .................. 4. Establishment No. ............................................

6. Alternate titles ............................................ 5. Date ............................................

............................................ Number of sheets ............

............................................ 8. Industry ............................................

............................................ 9. Branch ............................................

7. Dictionary title and code ............................................ 10. Department ............................................

11. WORK PERFORMED:

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(CONTINUE ON SUPPLEMENTARY SHEETS)

Analyst ............................................ Reviewer ............................................

*Figure 12.4.* Job Analysis Form Used by the United States Employment Service.

## SOURCES OF WORKERS

12. Experience: None .................... Acceptable ....................................................................................

....................................................................................................................................

....................................................................................................................................

13. Training data: Minimum training time—(*a*) Inexperienced workers.
(*b*) Experienced workers.

| TRAINING | SPECIFIC JOB SKILLS ACQUIRED THROUGH TRAINING |
|---|---|
| In-plant (on job) training | |
| Vocational training | |
| Technical training | |
| SRW Eng. General education | |
| Activities and hobbies | |

14. Apprenticeship: Formal .......... Informal .......... Length required ....................................................................
15. Relation to other jobs:
(*a*) Promotions from and to, transfers, etc.: ..........................................................................................

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....................................................................................................................................

(*b*) Supervision received: General ............ Close .............. By ..........................................................
(Title)

....................................................................................................................................

(*c*) Supervision given: None ............ Number supervised .............. Titles ..........................................................

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**The following items must be covered on supplementary sheets.**

## PERFORMANCE REQUIREMENTS

16. Responsibility (consider material or product, safety of others, equipment or process, cooperation with others, instruction of others, public contacts, and the like).
17. Job knowledge (consider pre-employment and on-the-job knowledge of equipment, materials, working procedures, techniques, and processes).
18. Mental application (consider initiative, adaptability, independent judgment, and mental alertness).
19. Dexterity and accuracy (consider speed and degree of precision, dexterity, accuracy, coordination, expertness, care, and deftness of manipulation, operation, or processing of materials, tools, instruments, or gages used).

## COMMENTS

20. Equipment, materials, and supplies.
21. Definition of terms.
22. General comments.

*Figure 12.4. Job Analysis Form (Continued).*

Form USES-180

DEPARTMENT OF LABOR
BUREAU OF EMPLOYMENT SECURITY
UNITED STATES EMPLOYMENT SERVICE

Budget Bureau No. 44-R571.3

## PHYSICAL DEMANDS FORM

Job Title .................................................... Occupational Code ..............................

| PHYSICAL ACTIVITIES | | WORKING CONDITIONS | |
|---|---|---|---|
| 1 ........ Walking | 16 ........ Throwing | 51 ........ Inside | 66 ........ Mechanical hazards |
| 2 ........ Jumping | 17 ........ Pushing | 52 ........ Outside | 67 ........ Moving objects |
| 3 ........ Running | 18 ........ Pulling | 53 ........ Hot | 68 ........ Cramped quarters |
| 4 ........ Balancing | 19 ........ Handling | 54 ........ Cold | 69 ........ High places |
| 5 ........ Climbing | 20 ........ Fingering | 55 ........ Sudden temperature changes | 70 ........ Exposure to burns |
| 6 ........ Crawling | 21 ........ Feeling | 56 ........ Humid | 71 ........ Electrical hazards |
| 7 ........ Standing | 22 ........ Talking | 57 ........ Dry | 72 ........ Explosives |
| 8 ........ Turning | 23 ........ Hearing | 58 ........ Wet | 73 ........ Radiant energy |
| 9 ........ Stooping | 24 ........ Seeing | 59 ........ Dusty | 74 ........ Toxic conditions |
| 10 ........ Crouching | 25 ........ Color vision | 60 ........ Dirty | 75 ........ Working with others |
| 11 ........ Kneeling | 26 ........ Depth perception | 61 ........ Odors | 76 ........ Working around others |
| 12 ........ Sitting | 27 ........ Working speed | 62 ........ Noisy | 77 ........ Working alone |
| 13 ........ Reaching | 28 ........ | 63 ........ Adequate lighting | 78 ........ |
| 14 ........ Lifting | 29 ........ | 64 ........ Adequate ventilation | 79 ........ |
| 15 ........ Carrying | 30 ........ | 65 ........ Vibration | 80 ........ |

DETAILS OF PHYSICAL ACTIVITIES:

888990 U. S. GOVERNMENT PRINTING OFFICE

*Figure 12.4.* Job Analysis Form (*Continued*).

3. Industry, plant, department, division, section.
4. Number employed.
5. Hires, quits, job absences.
6. Work performed.
7. Supervision given and received.
8. Level of difficulty.
   a. Responsibility.
   b. Knowledge.
   c. Initiative.
   d. Mental alertness.
   e. Judgment.
   f. Dexterity.
   g. Accuracy.
   h. Experience and education required.
   i. Other factors.
9. Pay rate.
10. Hours and shifts.
11. Output standards.
12. Job combination or breakdown.
13. Job relationship.
14. Machines, tools, equipment, material used.
15. Working conditions.
16. Social environment.
17. Physical demands.
18. Worker characteristics.

19. Previous experience required.
20. Training required.
    a. General level.
    b. Vocational training.
    c. Technical training.
    d. On-the-job training.
21. Selection methods.[1]

A comparison of these three outlines for a job analysis shows considerable overlapping. The point here is that for any organization the specific items to be included in the study may vary. The decision as to which type to use, or the development of a new form that will more readily conform to the needs of a particular company, will depend primarily on which of the many potential uses of a job analysis is considered the most important.

Industry is often concerned with making job evaluations rather than job analyses. The essential difference between these two is that job evaluation has as its function the establishment of equitable wage and salary rates. Job evaluations may be obtained by ranking one job, as a whole, against another job or by classifying jobs according to previously determined standards. These methods attempt to evaluate the job as a whole. The more common approach, however, is to evaluate job against job by breaking each into its elements. A rating system is usually used, such as that devised by Kress (*14*). In this system there are four major items and each item has subdivisions. Job evaluation is achieved by assigning one of five ranks to each of these items. Each job is rated for:

1. Skill:
    a. Education.
    b. Experience.
    c. Initiative and ingenuity.
2. Effort:
    a. Psychological demand.
    b. Mental or physical demand.
3. Responsibility:
    a. For equipment or process.
    b. For material or product.
    c. For safety of others.
    d. For work of others.
4. Job conditions:
    a. Working conditions.
    b. Unavoidable hazards.

[1] From Carroll L. Shartle, *Occupational Information,* 2nd ed. Copyright, 1952, Prentice-Hall, Inc.

Points are assigned to each of the subitems and the total points for a job are then transferred to the many values which establish the wage for that job.

Rothe, after interviewing hundreds of supervisors, has proposed six basic managerial operations (*23*): plan, decide, organize and delegate, communicate, lead, and analyze. He believes that decide, organize, and lead are predominantly personality characteristics while the other three are "intellectual." These characteristics are each rated on a sixteen-point scale in relation to the job complexity requirements and can result in a profile-type description of the man's characteristics as well as the job requirements.

The primary reason for including Rothe's research is to illustrate how breaking a job down into its operational functions can lead to a description of the job. Techniques such as this are applicable for jobs from menial tasks to the executive level.

### The Evaluation of Job Evaluation

Job evaluation techniques have been subjected to research and evaluation, as have all other topics, concepts, and tools in industrial psychology. Always the important questions are asked: What technique or method leads to more valid and reliable results? What are the advantages and disadvantages of one method when compared with another? Industrial psychology is never content to let an armchair proposal become an undisputed fact. This easy but often faulty practice does not meet its standards.

Lawshe and his co-workers have done an excellent job in a series of studies in job evaluation. Lawshe and Satter (*18*) did a factor analysis on data obtained from job ratings of hourly paid jobs in three different plants. Skill demands, or characteristics possessed by individuals and job characteristics or aspects of the job were the primary factors uncovered. The former were found to vary from 77.5 percent to 99 percent in the different plants studied and of course are the most important factor.

Lawshe (*15*) has also proposed an abbreviated scale consisting of "experience or learning time," "hazards," and "initiative." He indicates that this briefer scale yields results that would include 62 percent of the jobs in the same labor grade and an additional 37.2 percent displaced by only one labor grade.

Lawshe and Maleski (*17*) investigated the primary factors operating in a salary rating plan. Skill demands accounted for 95.6 percent of the

variance in the total point ratings. Supervisory demands accounted for 3.7 percent and job characteristics accounted for .7 percent.

An abbreviated scale was proposed and included "experience," "complexity of duties," and "character of supervision." About 96 percent of the variance may be attributed to these three items; the other eight items in the longer scale contributed the remaining 4 percent.

Lawshe and Alessi (*16*) factor-analyzed a different point rating system from the one just reported and found that three primary factors account for 96 percent of the variability in total point rating. Skill demands (general), job characteristics, and skill demands (specific) are the factors involved. Using an abbreviated scale made up of "responsibility," "manual skill," and "working conditions" would have yielded results that would have displaced only three jobs by as much as seven cents per hour.

Lawshe and Wilson (*19*) analyzed the job evaluation data based upon still another system. Using the factor analysis technique, they reached similar findings. It was possible to select three of the original five elements in the scale and these correlated +.99 with the original scale.

The essence of Lawshe's work in this area would indicate that abbreviated scales save time and yield results in job evaluation that closely approximate the original but more lengthy techniques.

Chesler (*5*) conducted a study to determine not only the reliability of a specific job evaluation manual but also the degree to which different types of job evaluation systems give the same results. In an adequately controlled experiment, he compared the results of a 12-item system with two systems including five factors, two point rating systems including 15 factors, a point rating system with 13 factors, and a ranking and grade system. The 12-item system included:

1. Work experience.
2. Essential knowledge and training.
3. Dexterity.
4. Character of supervision received.
5. Character of supervision given.
6. Number supervised.
7. Responsibility for funds, securities, and other valuables.
8. Responsibility for confidential matters.
9. Responsibility for getting along with others.
10. Responsibility for accuracy—effect of errors.

11. Pressure of work.
12. Unusual working conditions.

Chesler found that the job analysts who rated the 35 jobs studied obtained similar ratings. The reliability coefficients ranged from +.93 to +.99. Further, intercorrelation among these different company job evaluation systems ranged from +.89 to +.97. The obvious conclusion is that different job evaluation systems, when used by trained raters, will lead to similar results. If this be generally true, then it would appear that most job evaluation systems will lead to approximately similar results and that no one system has a distinct advantage over another. Keeping Lawshe's results in mind, one might conclude: the shorter the scale the better.

Chesler (*4*), using an abbreviated scale including only four factors—work experience, character of supervision received, character of supervision given, and responsibility for confidential matters—substantiates the findings of Lawshe and his associates. Abbreviated job evaluation scales are justified from the standpoint of technical and scientific accuracy and economy.

Satter (*24*) reports the results of applying two measurement techniques to the problem of building job evaluation scales. He compared the method of "paired comparisons" with the development of a scoring key applied to job specifications. The two methods yielded results which are very similar. The choice of which one is used depends, therefore, upon considerations other than accuracy or validity of measurement.

The scoring key method can be developed in a shorter period of time. The method of paired comparisons is useful when a comparatively large group of judges is available, or where a comparatively small number of new jobs need to be slotted into an already established wage structure.

It appears that the particular number of factors included in a job evaluation scale or the system of scoring does not lead to appreciably different results, provided the job evaluator is trained and knows the meaning of objectivity.

Gomberg (*11*) in a critical review of job evaluation from the trade unionist's point of view regards job evaluation as a subordinate tool in collective bargaining. His position is that job evaluation measures, to a limited extent, job content and not job worth. He considers the establishment of wages the responsibility of collective bargaining and does not

concede that wages can be established solely via the job evaluation technique regardless of the system used.

Gomberg's view is presented to shed some light on the realities that exist. Too often one studies a technique from only a single point of view. Later, and upon application, one is surprised to find that others do not accept the "rigorous by-products of science."

### Psychological Contributions to Job Analysis and Evaluation

Flanagan (9) has proposed a technique known as "critical incidents." His view is that this technique integrates the problem of job definition, selection and classification, and the development of criteria measures, and further makes it possible to conduct research on the criterion problem on a sound and rational basis. This procedure establishes the critical requirement through direct observation by participants or supervisors. A critical requirement is defined as a requirement which is crucial in the sense that it has been responsible for outstandingly effective or definitely unsatisfactory performance of an important part of the job. According to Flanagan, a critical requirement differs from the requirements which appear to be important but in practice have no important effect on performance.

Flanagan (8) considers job requirements as stated in terms of critical requirements of the job. These are determined by the collection of reports of behavior which were critical and made a difference between success and failure in the observed work situation.

Another technique aimed at establishing a criterion of performance is known as "forced choice." One form of this technique requires the rater to choose one of two desirable adjectives or phrases which describe the person being rated. The rater must also choose one of two undesirable qualities. Although the items seem equally desirable or undesirable, only one of each pair discriminates between competence and incompetence. In other words, the items are matched for preference equivalence but differ on discrimination. An example of such a block or tetrad is (2):

a. Aim of lesson is clearly presented.
b. Refrains from spending too much time boasting of his experiences.
c. May "bawl out" or ridicule a student in the presence of others.
d. Does not get to know each student's problems.

Items a and b have been found to be equal in preference but item a is the discriminator. Items c and d are also approximately equal in preference but item c is the discriminator. These tetrads are built with care by

establishing both preference and discrimination indexes for each item and then combining them into the tetrads. Modification of the forced-choice technique may have five items, one of which is neutral, or six items, or four items all equally desirable by preference, and so on. Forced choice, then, is a form of merit rating that attempts to avoid the "halo" effect in rating, which is a tendency on the part of raters to be consistent in assigning "good" or sometimes "bad" ratings to an individual. Using this system results in a wider spread of ratings and does not require that the raters be trained. It is exceedingly difficult for a rater, even a self-rater, to "fake" since he cannot guess which of the two equal items preferentially is the discriminator. Scores on a forced-choice rating system can be used as an aid in selection. Under other circumstances they can be used to determine the persons with effective performance, and therefore forced choice becomes a means of obtaining a criterion group.

Ghiselli found that forced-choice inventories can give satisfactory predictions of performance of supervisory ability and suggests that more elaborate procedures are unnecessary (*10*). This is a confirmation of earlier work, especially that reported by Radom, who found this technique rather useful in picking better foremen at Standard Oil of New Jersey (*21*).

Job evaluation systems, critical incidents, and forced choice have been favorite means of psychologists to obtain objectivity in the criteria against which all varieties of predictors are measured. Even though these systems tend to be more objective and desirable, one should not lose track of the earlier rating systems used. These include rating on a 5-, 10-, or 14-point scale with either numbers or words serving continuity from poor to excellent. Rating systems have also been used in which one man is compared with another. Whether one uses a scale, the method of paired comparison, or any other system of evaluating a man or job, it is always important to have a rating be objective rather than subjective. It is most important that any rating system be checked for reliability and validity. It must uniformly measure what it is intended to measure.

Habbe (*13*) recommends that the appraisals of job performance are valuable in considering promotions, salary increases, and other personnel problems. The two precautions necessary to make any evaluation system effective require that management recognize the responsibility of training raters and arrange for an opportunity for the rater and the rated to discuss the rating. Workers generally want to know where they stand in the eyes or minds of their bosses. Habbe reports that while most com-

panies employ traditional rating methods, forced-choice and critical-incidents techniques are being introduced.

Unions tend to be suspicious of company rating programs. They generally advocate the seniority principle and prefer collective rather than individual dealing. Grievance and arbitration cases have grown out of contested rating reports.

Habbe's report has value in so far as it summarizes the procedures used in nine companies. It reports in detail how and why the programs were begun, how they were operated, their values and limitations. The companies are:

1. Aldens, Inc.
2. Atlantic Gelatin Division (General Foods Corp.)
3. Atlantic Refining Co.
4. Berger Brothers
5. Inland Manufacturing Division (General Motors Corp.)
6. Mission Appliance Corp.
7. Owens-Illinois Glass Co.
8. Standard Oil Co. of California
9. Company A

Possibly the greatest value of Habbe's report is the importance attached to training the evaluator not only for rating but also for reporting back to the employee. The communication of rating results is essential. It is a complex and difficult process, as Covner points out (*6*). He favors the non-directive interviewing techniques to prepare the way for understanding the ratings, acceptance of them, and constructive action based upon them. Too many companies have given up rating systems when their raters were not prepared to know how to handle those employees whose self-estimate differed from the estimate by superiors. Habbe's report also includes exact copies of the rating forms used by the various companies. Anyone planning to introduce rating forms would do well to see this collection conveniently gathered in one report.

As mentioned previously, the psychologist's interest in job analysis is the man aspect of the job, and two contributions along these lines have been Viteles' job psychograph (*27*) and the occupational ability pattern devised by the Employment Stabilization Research Institute of the University of Minnesota. Although both have more historical than practical significance since neither is now widely used, they do represent interesting departures on the theme of job evaluation.

Viteles' job psychograph consists of a complete statement of the personnel requirements for a job. Theoretically it involves an analysis and specification of special abilities necessary for success. A uniform list of traits is presented and each trait is rated on a five-point scale in accordance with its degree of importance for the specific job.

The job psychograph presents certain difficulties. For example, each trait listed requires specific definition. A major although surmountable difficulty in using this technique is that the person doing the rating must be trained in the understanding and knowledge of the specific traits. Furthermore, up to the present time, psychologists have not been able to develop, to their complete satisfaction, valid measures of many of the traits listed. Proficiency, alertness, and initiative are a few examples. However, the job psychograph has its use in industry and in many respects embodies no more errors than Kress's rating system.

A job psychograph for a power machine operator is shown in Figure 12.5.

Another example of a job psychograph is shown in Figure 12.6. A comparison of these two psychographs shows some differences of the traits involved.

There is an important implication for vocational guidance and selection in the job psychograph, and that is the fact that a person without experience in a specific job can be rated for the possession of the various traits and the resulting profile matched with the profile for a specific job. When there is a resemblance, job and applicant can be brought together.

Paterson, Dvorak, and others connected with the Employment Stabilization Research Institute of the University of Minnesota, where the occupational ability pattern was devised, were interested in carrying the job analysis technique one step farther. They assumed that abilities on a job can be measured by a representative sampling of psychological tests and, further, that the battery, or collection of tests, was such a sampling. With these assumptions they gave a battery of tests to groups of individuals who were successful in specific occupations and obtained scores and profiles of the most typical test performances of people on the job. The occupational ability pattern thus attempts to avoid trait specifications such as Viteles proposes, and it also tries to avoid evaluative and subjective opinions, even though they are obtained from experts. The tests attempt to sample the abilities and aptitudes of the individual on a rather wide range and cover such material as verbal intelligence, finger dex-

terity, spatial relations, and eye-hand coördination. A more complete discussion of psychological tests was included in Chapter 10.

There is an even more obvious relationship between this technique and vocational guidance and selection than there was with the job psycho-

| | 1 | 2 | 3 | 4 | 5 | Remarks |
|---|---|---|---|---|---|---|
| 1. Energy | | X | | | | |
| 2. Rate of discharge | | | X | | | |
| 3. Endurance | | X | | | | |
| 4. Control | X | | | | | |
| 5. Coordination A | | | | X | | |
| 6. Coordination B | | | | | X | |
| 7. Initiative | | X | | | | |
| 8. Concentration | | | X | | | |
| 9. Distribution (of attention) | | | X | | | |
| 10. Persistence | | | X | | | |
| 11. Alertness | | X | | | | |
| 12. Associability | | X | | | | |
| 13. Visual discrimination | | | | X | | |
| 14. Auditory discrimination | X | | | | | |
| 15. Tactual discrimination | X | | | | | |
| 16. Kinesthetic discrimination | | | X | | | |
| 17. Space perception | | | | X | | |
| 18. Form perception | | X | | | | |
| 19. Accuracy | | | X | | | |
| 20. Visual memory | | X | | | | |
| 21. Auditory memory | X | | | | | |
| 22. Kinesthetic memory | | X | | | | |
| 23. Understanding | | X | | | | |
| 24. Understanding (quickness) | X | | | | | |
| 25. Observation | | | X | | | |
| 26. Planfulness | | X | | | | |
| 27. Intelligence | X | | | | | |
| 28. Intellect | X | | | | | |
| 29. Judgment | X | | | | | |
| 30. Logical analysis | X | | | | | |
| 31. Language ability | X | | | | | |
| 32. Executive ability | X | | | | | |

Key: 1. Negligible.
2. Barely significant.
3. Significant.
4. Of great importance.
5. Of utmost importance.

*Figure 12.5.* Job Psychograph of a Power Machine Operator. (From J. L. Otis and K. R. Smith, Job psychograph in job analysis, *Occupations* [1934], 12:10, 47–56.)

| DEPARTMENT: | Division: Auditing | | | | |
|---|---|---|---|---|---|
| Accounting | 1 | 2 | 3 | 4 | 5 |
| Rate of discharge | | | | | XX |
| Coordination A | | | | X | |
| Initiative | | X | | | |
| Concentration | | X | | | |
| Distribution of attention | | | | X | |
| Persistence | | | | X | |
| Alertness | | X | | | |
| Auditory discrimination | X | | | | |
| Tactile discrimination | X | | | | |
| Space perception | X | | | | |
| Form perception | X | | | | |
| Accuracy | | | | | XX |
| Visual memory | | | | X | |
| Auditory memory | X | | | | |
| Kinesthetic memory | | X | | | |
| Understanding | | X | | | |
| Understanding (quickness) | X | | | | |
| Observation | | | | | XX |
| Planfulness | | X | | | |
| Intelligence | X | | | | |
| Judgment | X | | | | |
| Logical analysis | X | | | | |
| Language ability | X | | | | |
| Executive ability | X | | | | |

*Figure 12.6.* Job Psychograph of an Auditor. (From B. J. Dvorak, *Differential Occupational Ability Patterns,* University of Minnesota Press, 1935.)
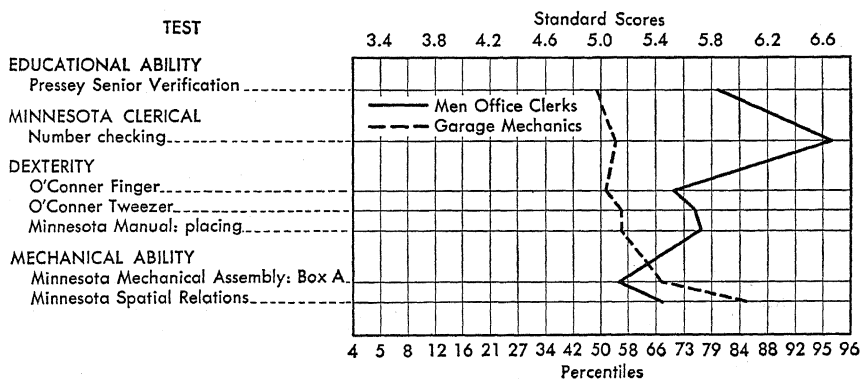
*Figure 12.7.* Various Occupational Ability Patterns. (From B. J. Dvorak, *Differential Occupational Ability Patterns,* University of Minnesota Press, 1935.)

graph. A person can be given the battery of tests and his profile then compared with the profile typical of various occupations. He can then be given the job whose profile has the greatest resemblance to his own. Sample occupational ability patterns are presented in Figures 12.7 and 12.8.

### Occupational Information

As a result of the many job analyses that have been made in many industries, a huge body of knowledge known as "occupational information" has accumulated.

One of the very valuable contributions of the United States Employment Service has been the preparation of the *Dictionary of Occupational Titles* containing definitions of 21,643 occupations. This publication, the only thorough one of its kind, is useful not only in employment offices in industry but in vocational guidance and related fields. Robert C. Goodwin (*12*), director of the Service, has described it as a compilation of all the different jobs in the economy:

> The dictionary describes each of these jobs and outlines the minimum qualifications for filling them. It shows the relationship of one kind of job to other kinds of jobs so that if a worker cannot locate a job in his particular skill, local employment personnel, by using this dictionary, can find out what other types of work his qualifications fit him for and thus refer him to a job. The dictionary is a standard work that is widely used by industry, by other Government agencies, libraries, and the Employment Service offices in the various States. All of the States use this as basic material for classifying orders from employers and selecting people to fill jobs.

The *Dictionary* consists of four parts: Part I, "Definition of Titles"; Part II, "Group Arrangement of Occupational Titles and Codes"; Part III, "Supplement"; and Part IV, "Entry Occupational Classification." It was first issued in 1939 and a revised edition came out in 1948. It has become the standard reference source not only for the U.S. Employment Service but for other governmental agencies and the Canadian government.

Standardization is necessary in describing jobs and occupations if the maximum utilization of the available information is to be achieved. The *Dictionary* has been a great aid in this direction. For example, the occupational information gathered in an industrial program carried out by the U.S. Employment Service led to interesting and somewhat unexpected results, such as the fact that a stone planer is able to do the job of a metal
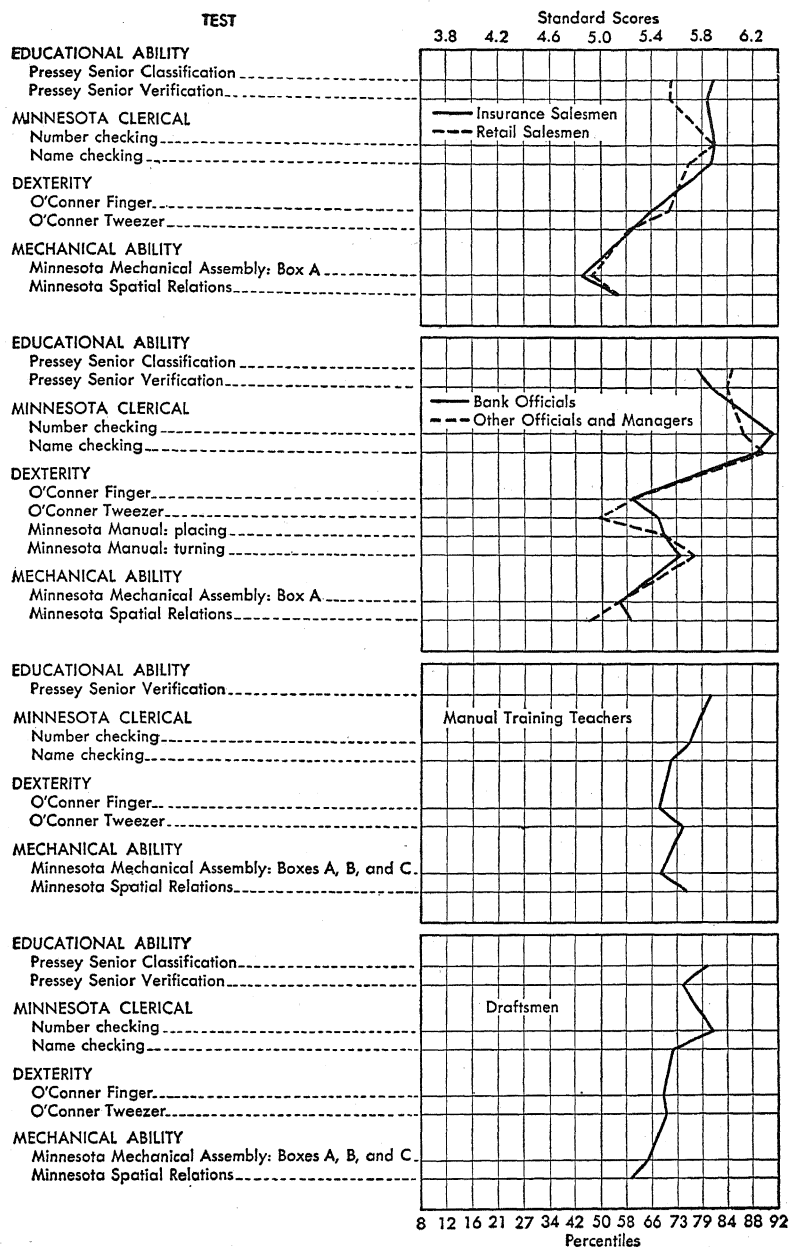
*Figure 12.8.* Various Occupational Ability Patterns. (From B. J. Dvorak, *Differential Occupational Ability Patterns,* University of Minnesota Press, 1935.)

planer. The job analysis for these two jobs showed that the skills, aptitudes, and experience for both of them were essentially the same. The fact that the stone planer worked on different materials in a different industry was not as important as might be assumed. In another instance a close relationship was found between the job of a plasterer and that of an asbestos pipe coverer; the metamorphosis was completed easily by teaching the plasterer how to sew. Both the Army and the Navy, during World War II, found that knowledge of occupational information expedited transfers from civilian to military occupations.

Dr. Carroll L. Shartle has compiled a valuable source book entitled *Occupational Information* (*26*). He has presented the available material in such a manner as to show clearly the need for occupational information on the part of industry, education, and the community. The book also contains pertinent facts on occupation trends and the labor supply and demand.

Occupational information based upon job analyses has resulted in information about "occupational families," or groups of related occupations with similar characteristics. This material is useful for business organizations that are considering the transfer and upgrading of personnel, and for communities seeking new industries. "Occupational family" information can also help the individual who is seeking a job.

Another value of occupational information is the increased knowledge it gives people about jobs. There are very few people who can name more than a few hundred occupations, and yet there are thousands of different ones.

An article by Shartle (*25*) serves as an illustration of the lack of knowledge that most people have concerning specific jobs. The need for occupational information is well brought out by examining the list of varied positions held by psychologists. The average person, and to some extent even the sophisticated college student, usually believes that a psychologist either teaches at a college or gives tests. Table 12.1 lists some of the positions held by qualified psychologists in various agencies, institutions, or organizations. This list makes it obvious that some of the positions are not clear; that is, they lack definition and description. A list of positions is useful but it must be supplemented by additional relevant material.

## Summary

Job analysis is the minute description of the duties and requirements, as well as the man aspects, of the job. There are many uses to which a

job analysis can be put and in many respects the job analyst does the fundamental work on which training programs, personnel policies, and wage rates are based. Job analyses are relatively simple to perform and do not require much technical information or previous training. They should be made in small as well as large organizations, in offices as well as factories.

Table 12.1. Positions Held by Psychologists

| | |
|---|---|
| College teaching | Rehabilitation training officer |
| College counseling | Personnel psychologist |
| Educational research | Consulting psychologist |
| Public schools—psychologist | Public opinion survey psychologist |
| Clinical psychologist | Psychometrician |
| Child guidance | Employment interviewer |
| Psychologist—feeble-minded institution | Employment counselor |
| Psychologist—hospital for insane | Occupational analyst |
| Psychologist—penal institution | Vocational adviser |
| Court psychologist | Vocational counselor |
| Personnel examiner | Research psychologist |

Evaluation of job evaluation is essential. Work by Lawshe and Chesler indicates that brief scales are more economically applied and for practical purposes are almost as good as the more lengthy scales. The techniques of critical incidents and forced choice show the interrelation of the problem of job evaluation and the psychologists' continued search for objectivity in rating as well as in ascertaining a criterion. The job psychograph, which defines the job in terms of specific traits, and the occupational ability pattern, which defines the job in terms of performance on a battery of psychological tests, are examples of earlier attempts by psychologists to emphasize the psychological requirements of a job. A by-product of job analysis is the vast amount of occupational information, which is useful not only in vocational guidance and selection but in connection with occupational trends in the labor supply and demand. This material plays an important role in the successful operation of a business.

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CHAPTER 13

# Work Environment

THE problem of increasing production and also making work more pleasant has been approached through the introduction of changes in the working environment. There is a fundamental difference between this approach and that in which increased efficiency is attained as a result of time and motion studies. Although such studies sometimes lead to environmental changes, the changes are usually related to the job, such as changing the height of a stool or the size of a work area. In other words, time and motion studies most often result not in environmental changes but in changes in an integral part of the job.

There are still other approaches, such as increasing efficiency through refined selection techniques. Under these circumstances no direct attention is given to the environmental factors related to the job.

The list of the various environmental changes that could conceivably be introduced in industry is lengthy. Changes related to noise as it affects work, as well as changes in connection with the illumination, ventilation, and temperature of the work environment, have been introduced with varying claims of success. A popular environmental change is the introduction of music into the office or factory. Many claims in connection with a change in production have been based on the use of various color schemes, primarily on factory walls, but also on benches and machines, and in rest rooms.

Another category of environmental changes for improving production includes such miscellaneous items as eating facilities, fresh drinking water, and even the physical distance between two co-workers.

Unfavorable environmental conditions supposedly contribute to a slowdown of the employee's activities and production. They allegedly increase turnover, promote high absenteeism, and generally contribute to inefficiency.

There is no doubt that people generally prefer pleasant to unpleasant surroundings and that when attention is paid to creating a favorable working environment, as well as to actual job performance methods, overall pleasantness prevails. However, one must be somewhat cautious in accepting all the claims made as to the results of creating a favorable work environment. Much of the work that has been done in this field has been guilty of serious error in its experimental methodology, and naïve assumptions have too often been made with reference to the work. In an ideal experiment one factor is varied and all other factors are either eliminated, neutralized, or held constant.

It is not safe to assume that a change in production can be attributed to a specific environmental change. When an environmental change is made, at least two things happen. First, there is the changed environment, and second, and equally important, there is the response to change in general. This response may be due only partially to the specific change; it may also be due to change of a more generalized nature. Suppose that sound control is introduced into a plant and that work proceeds with less noise. Let us assume that production increases 5 percent. According to sound scientific procedure, we are not justified in attributing this 5 percent increase solely to sound control. Although a certain amount of the increase *is* the result of the sound control, a certain amount of the increase is due to the fact that *a* change has taken place. The attitude of the employee must be reckoned with in this connection, for the same 5 percent increase in production might have occurred when *more* noise was introduced. For instance, in a hypothetical situation production might conceivably be low because the employees spend their time talking to one another. If someone introduced a new infernal machine which created so much noise that it made conversation impossible, we would be more cautious in coming to the conclusion that the introduction of the noisy machine, of itself, increased production.

In other words, the major problem in the introduction of environmental change is whether the resulting increase in production is to be attributed to the factor that is changed or to the factor that is incidental to *a* change.

In addition to this error in methodology, there is the fact that the employee and his attitude toward change have not been fully taken into consideration. An altruistic employer may take steps to improve the work environment, but whether such steps will result in increased production —as is always claimed—will depend upon how the employees as a group

interpret this change. If they believe that he has spent a lot of money in order to take advantage of them, they will resist the change, even though the environment is made more pleasant. If, on the other hand, the change raises morale, it will have the result he desired.

An excellent illustration of this is the case of the employer who had his factory and sales room in the same building. Air conditioning was installed in the sales room, but not in the factory. The employer succeeded, primarily, in creating greater dissatisfaction. The salesmen disliked the air conditioning because they believed that they would have more colds on account of it. The factory employees, who recognized that they held jobs of less prestige value, interpreted the change as just another instance of their being held in lesser esteem. Both groups felt that the installation of air conditioning in the sales room was motivated not by their employer's concern for his employees' welfare but solely as a method of increasing business.

The Hawthorne Studies, reported rather fully in Chapter 2, reviewed the effects of a change in illumination on production. It will be remembered that no direct relationship was shown to exist between the physical change and production. The contribution of the Hawthorne Studies in relation to all changes involving environmental conditions is significant.

Too often variables are not controlled. For example, an increase in temperature and the resulting production figures will be reported without taking the precaution of determining whether no temperature change or a decrease in temperature would result in a change in production.

The essential point in connection with studying changes in work environment is the use of adequate experimental controls before conclusions are drawn. The author considers that changes in work environment, especially when they are conducive to more pleasant surroundings, are desirable. However, a change in production figures often has little or nothing to do with such environmental changes. This does not mean that one should forsake the idea of introducing music, decreasing noise, or controlling the temperature of the workroom. It *does* mean that miracles cannot be expected as a result of these changes, and that each positive claim must be substantiated.

### Music in Industry

A popular environmental change is the introduction of music during working hours. Although plant broadcasting is little more than twenty-five years old, most of the "sound and fury" has been relatively recent. Possi-

bly one of the reasons for the popularity of music is the variety of ways in which it can be provided. On an extremely informal basis, music can be brought into a plant by merely plugging in a radio and allowing it to blare from the beginning to the end of the workday. Some employers have introduced music in an even more informal way by encouraging their employees to sing. Every now and then a newspaper clipping, like that in Figure 13.1, causes an employer to think about the idea.

**MUSIC HATH CHARMS**

**To Drive Away Fatigue, Is Belief of New Jersey Employer**

Special to THE NEW YORK TIMES.

HILLSIDE, N. J., April 6—Designed to enable employes "to go through the day with a minimum of fatigue," four hours' swing music and opera will be provided daily through a new system installed in the Bristol-Myers Company's chemical plant here.

The music will be presented from 8:30 to 9:30 in the morning, two hours during the lunch period, beginning at 11:30 A. M., and from 3 to 4 P. M. Radio and recorded music is to be used.

"We believe that music, news and other types of informative and entertaining programs will be an aid in enabling plant and office workers to go through the day with a minimum of fatigue from a good day's work," William M. Bristol Jr., a company official said.

*Figure 13.1.* Music Hath Charms. (By permission of *The New York Times.*)

In this connection, a sad yet humorous experience was called to the writer's attention by an employer who had a small factory. This man had serious doubts about the advisability of music in industry; he said that there had been bedlam in his plant ever since he allowed his employees to sing. His story was so pathetic and so amusing that the writer visited the factory. The girls worked at a series of long work tables in relative silence; suddenly one girl would start to hum, and the others would join her shortly afterward. Actually, this man's employees comprised two minority groups; singing seemed to make the girls suddenly conscious and proud of their minority status. When one girl began singing a native song

and was joined by others in her group, this was a signal for the other group to sing some of its native songs. From then on, challenge was hurled upon challenge, volume increased steadily, and chaos ensued. Needless to say, this is not the way to use music in industry.

Music broadcast by radio requires a minimum capital investment—the purchase of a radio—but may introduce other difficulties. Just what station is to be tuned in and who shall have the right of decision often becomes a problem of management. Years ago a factory that manufactured radio tubes had to prohibit playing the radio during lunch hour because of the excessive arguing among the employees as to what type of program they should listen to. The installation of additional radios was no solution. This company temporarily solved the problem of music during the lunch hour by permitting phonograph records to be played. Since the employees brought in the records and they were played in sequence, there was less chance for bickering.

Another disadvantage of the radio for industrial use is the commercials. Further, the type of music cannot be controlled. It is a fact that young women workers will, according to the fashion of the moment, not only stop work but even swoon when some crooner is broadcasting, and the crooner is on the air more often than the boss would like. The radio may not be heard with equal intensity and clarity in various parts of the plant, but a loud-speaker system can overcome this.

A more desirable method of providing music is to use either piped-in music or a standard system of industrial broadcasting controlled by the firm itself or by an outside source.

The generalization is possible that music during repetitive factory work results in a slight increase in production. Some of the best experimental work in this field has been directed by Williard A. Kerr (8). Recognizing the need for basic research in order to clear up the maze of anecdotes and armchair speculations on the subject, he carried out four specific experiments on the introduction of music in actual industrial conditions. In all four experiments, records were played over the company broadcasting system.

The first experiment was made in the Paper Capacitator Department of a modern factory and lasted a little less than two months. On "music days" a varied musical program was broadcast to all 197 employees at the following times: 9 to 9:15, 10:15 to 10:35, 11:30 to 12:00, 12:00 to 12:20, 1:30 to 1:45, 2:45 to 3:10, and also at the beginning and the end of the shift. The subjects in this experiment were 64 women operators, 90 per-

*Figure 13.2.* Location of Loud-Speaker for Effective Penetration of Existing Noise Barriers Without Resorting to Excessive Volume. The Orenduff & Kappel, Inc., plant in Westbury, New York, a long-time Muzak subscriber, has proved to itself the benefits accruing from the use of background music in industry in the form of more efficient operation and decreased employee turnover. Note the new improved bell speaker in the upper right center of the picture. This speaker provides nondistracting music to the illustrated section of the plant. (Courtesy of Muzak Corporation.)

cent of whom had been accustomed for at least five months, to music in the department. This latter control is important because of the fact that the employees were accustomed to music made it possible to test the effect of music rather than the effect of a change. The subjects were not told that they were taking part in an experiment; this is also important, because production might vary as a result of the suggestion of the experiment rather than of the experiment itself.

The experiment involved no change in working habits or conditions except that there was no music two days out of every four. On "no-music days" the employees were told that work was being done on the plant's sound system. Saturday was excluded from the experiment because the company recognized that the level of operation that day was irregular and subject to irrelevant outside influences. Although these influences are irrelevant from the company's point of view, it is ridiculous to pre-

sume that they are irrelevant from the employees' point of view. A heavy date Saturday night or the idea of a day off on Sunday can interfere with an experiment on music in industry. Furthermore, if these so-called irrelevant influences are not taken into consideration, they will interfere with an entire efficiency system, regardless of whether it is based on industrial psychology or something else.

Kerr collected data for each of 40 days on three operations—roll assembly, winding, and can assembly. Quantity, quality, and net good yield —i.e., production with both quantity and quality taken into consideration —were the measures of performance obtained. Although none of the differences were statistically significant, *quantity* of production was higher in all three operations when there was music, but *quality* was worse in two out of the three operations where such a measure was available.

In the roll assembly operation quantity was +0.75 percent better and the net good yield was +0.57 percent better; but scrappage, which is a measure of the quality of production, was 9.89 percent greater with music. The fact that production increased but so did spoilage raises a serious question as to what is the ultimate measure of success. In this instance, the answer is provided by applying the criterion of "net good yield," which is a combination of quality and quantity; in these terms, overall production was bettered by approximately 0.5 of 1 percent with music. For the winding operation, quantity was 1 percent better, but scrappage was 14 percent greater. Kerr found it impossible to obtain a net good yield value for this operation. In the can assembly operation quantity increased by +0.43 percent. This first experiment of Kerr's indicates that there is a slight increase in production, but there is also an increase in spoilage.

The second experiment conducted by Kerr took place in a factory whose employees worked on quartz crystals. There were 53 subjects, all members of a union and working on a straight hourly rate; the experiment lasted 107 workdays. Again, music was played at the same periods of the day as in the first experiment. There were three days of music, then three days without music. Three kinds of music were broadcast, but on no two days in any three-day cycle was the same type used. The first kind consisted of a variety program and included such selections as "Smoke Gets in Your Eyes," "Good Night Aloha," and "Emperor Waltz." The second was "sweet" music—not jazz and not too heavily accented; examples are "White Blossoms of Tah-ni," "Missouri Waltz," and "This Is No Laughing Matter." The third type was "peppy," typical titles being

"Hot Clarinet Polka," "Jersey Bounce," "Ti-Pi-Tin," and "The Stars and Stripes Forever." Because of the length of time covered by the experiment, it was assumed that the effects of outside influences, such as weather, payday, personal joys and sorrows, or a bad run of quartz, would be eliminated or held constant.

Six measures of production were obtained for "no music" and the various types of music. Figure 13.3 presents the results, with net good yield
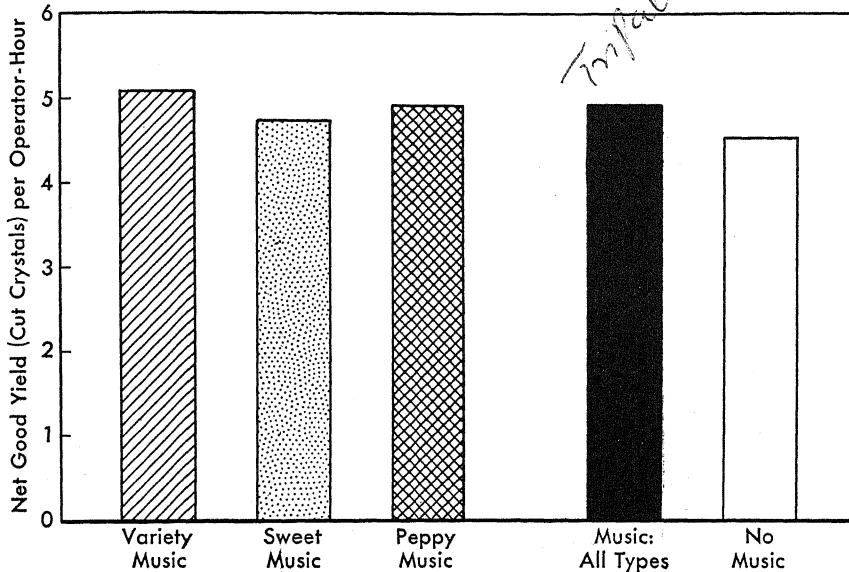
*Figure 13.3* Effect of Various Types of Music Production. (Adapted from *Experiments on the Effects of Music on Factory Production* [Applied Psychology Monographs, No. 5], by Willard A. Kerr, with the permission of the author and of the publishers, Stanford University Press, 1945.)

as the criterion. Once again Kerr finds none of the differences obtained approaching statistical significance. The quantity of crystals finished is greatest with peppy music, but the quality is poorer than with variety or sweet music.

There are no consistent differences on the basis of type of music, but a production increase is found when the average for 56 music days is compared with that for 51 no-music days. Scrappage is lower on music days than on no-music days. Whereas in the first experiment the average increase in production was about 0.5 of 1 percent, in this experiment the average increase is much greater. For example, the 40 employees

doing the finishing job showed an increase in quantity of 4.82 percent with music and 8.3 percent less scrappage; the net good yield is 9.07 percent higher. The net good yield among the 53 employees is +7.64 percent. Kerr finds that all differences in the six measures of production favor music as opposed to no music.

In his third experiment, Kerr used a group of 520 women operators in a glass radio-tube factory. This factory had broadcast to its employees a radio music program known as the "Make-Believe Ballroom" over a long period of time. In addition, a birthday, anniversary, and soldier request program was broadcast between 1:00 and 1:30 P.M. According to management, this program was very popular and it was deemed unwise to discontinue it during the experiment; accordingly it was continued.

A music-preference questionnaire survey was conducted among the employees, sixteen types of music being ranked from most to least popular, as follows:

1. Hit Parade type
2. Patriotic
3. Waltzes
4. Marches
5. Hawaiian
6. Semiclassical
7. Polkas
8. Sacred
9. Hillbilly
10. Classical
11. Blues
12. Western
13. Fast dance
14. Spirituals
15. Humorous-novelty
16. Square dances

All sixteen types were liked to some extent; the average of each of these categories was always greater than the indifference point. On the "more-music" days one of three types of music—Hit Parade, waltz-Hawaiian, and march-polka—was played at the following times: 8 to 10:30 A.M., 11:00 to 11:45 A.M., and 1:30 to 3:15 P.M. In terms of the above questionnaire rankings, the first type was the most popular; the second type included the third and fifth most popular, and the third group included the fourth and seventh most popular.

Before the experiment was begun, the group was told that it would hear a specific type of music on a given day. On one day it would be Hit Parade music, on another only waltzes and Hawaiian music, on the third polkas and marches. It was also told that on some days there would be no music, except the two programs which it had been accustomed to hearing. The group was informed that after some weeks it would be asked to vote on the type of program it most preferred.

Three jobs, all requiring a high degree of hand-eye coördination, were performed by these 520 operators. One interesting finding was that the amount of music played on march-polka days had to be reduced because of the complaints from the employees. Some of these workers threatened to quit unless "something is done about those marches and polkas." However, when this music was included in the Hit Parade programs, there were no such complaints.

Again, as in the preceding experiments, Kerr obtained production averages for the various types of music days. We should mention that these employees were on an incentive basis. The findings are presented in Table 13.1.

Table 13.1. Average Quantity and Quality in Radio-Tube Manufacture with More Music, Less Music, and Various Kinds of Music

| Output | Hit Parade (14 days) | Waltz-Hawaiian (14 days) | March-Polka (13 days) | Less Music (13 days) | More Music (41 days) | Percent Better with More Music |
|---|---|---|---|---|---|---|
| Quantity | | | | | | |
| Miniature tubes | 13.65 | 12.89 | 15.34 | 13.70 | 13.92 | +1.61 |
| Glass and power tubes | 13.12 | 13.09 | 12.92 | 12.92 | 13.05 | +1.01 |
| Quality | | | | | | |
| Miniature tubes | 95.94 | 94.30 | 95.54 | 99.40 | 95.41 | −4.18 |
| Glass tubes | 79.35 | 76.29 | 76.65 | 85.64 | 77.48 | −10.53 |
| Power tubes | 97.77 | 100.35 | 104.83 | 101.97 | 100.90 | −1.06 |

Both output and quality were lower on waltz-Hawaiian days than on Hit Parade or march-polka days, even though complaints and comments indicated that the employees liked waltz-Hawaiian better than march-polka music. The complaint against the waltz-Hawaiian programs was: "They put us to sleep." Production on march-polka days was slightly greater than on Hit Parade days, but the quality was better on Hit Parade than on march-polka days in two of the three cases.

Kerr's fourth experiment was concerned with the differences between orthacoustic recordings and ordinary records. Slight but statistically non-significant differences appeared in favor of orthacoustic records. How-

ever, since the playing time for the ordinary record was three minutes and for the orthacoustic two and a half minutes, it may be that this, rather than any difference in the quality of recording, was responsible for the results.

The primary reason for reporting this series of experiments in such detail is to illustrate careful industrial experimentation. Although the findings in general show that production increased slightly, they make it clear that the introduction of music does not increase production to any considerable extent. The big problem in relation to music in industry —the attitude of employees toward the music—is touched upon only slightly by Kerr. His third experiment showed that there is no definite relationship between the order of preference as to type of music and production. In fact, music of an unpopular variety, the polka-march category, does not affect production at all.

In another study in this field, Smith (*13*) distributed a questionnaire to approximately 1000 employees in a factory manufacturing a small radio part. The results showed that 98 percent of the employees thought that music during working hours would be "mildly pleasant" or "extremely pleasant." In studying a day shift and a night shift of 21 employees each, Smith found that the average production increase for the day shift was 7 percent, and for the night shift it was 17 percent. However, this increased production may be due only in part to the music; some of it may be due to the change.

Smith found that maximum production was obtained when music was played 12 percent of the time on the day shift and 50 percent of the time on the night shift. The more an employee wanted music, the more the music tended to increase his production; and the more the employee's job permitted conversation while working, the more the music tended to increase his output. Smith concludes, "Music probably produces its major direct effect when the individual's capacity for attention is not absorbed by his work; in this circumstance, music appears to direct unused attention from brooding, talking, or off-the-job activities."

McGehee and Gardner (*9*) conducted a study to determine the effects of music on production in a relatively complex industrial job known as "setting" in rug manufacturing. Their results are unlike the findings of Kerr and Smith. They found that music had neither a favorable nor an unfavorable effect on production. In response to a questionnaire 59 percent of the workers said they got more work done with music as compared with a negative response of 7 percent. This is most interesting

since it clearly shows that attitude cannot be accepted as a measure of behavior. Although the workers may have had a more favorable attitude and believed that they produced more, they did not produce more.

McGehee and Gardner find that the assumption held by many that more favorable attitudes and a reduction in monotony increase production is not substantiated in fact. With reference to the specific investigation the results show that for a complex industrial job and under stable conditions music does not increase production.

A factor that is generally ignored in studies of the effect of music on production is rhythm. It is entirely possible that music influences production most when its rhythm is compatible with the employee's rhythm of work or when it tends to pace him.

An unpublished study by a student in a class in industrial psychology clearly established that more people skate on a rink when waltzes are played than with other types of music or when there is no music. Furthermore, the speed of the skaters increases during waltz music.

While some work has been done in industrial situations, little, if any, worth-while experimental work has been done with office work situations. However, music in industry has been extended to offices.

As McGehee and Gardner point out (9), "Too often the effect of music on production, absenteeism, turnover, accident rates, and workers' attitudes is 'measured' in terms of the optimistic beliefs concerning its effectiveness held by those responsible for its installation and programming."

An organization known as Muzak has done some research in both fields. According to the research director of this company, waltzes, ballet music, light concert selections, and concert arrangements of popular dance music are suitable for office workers, but an inspection of procedure, controls, and experimental method forces the conclusion that this work is not as rigorous as that of Kerr, Smith, and McGehee and Gardner.

Among the concerns regularly using planned musical programs for their office employees and being programed by Muzak are Metropolitan Life Insurance Company; Northern Mutual Insurance Company; Research Institute of America; Reader's Digest; Erwin, Wasey & Company, Inc. (advertising agency); Bank for Savings (all branches); American Cyanamid Company; American Tobacco Company (general and executive offices); Chemical Construction Company (architectural and drafting rooms); Prudential Insurance Company of America; Emigrant Industrial

Savings Bank; Reuben H. Donnelley Corporation; Liberty National Bank; McGraw-Hill Publishing Company, Inc. (direct-mail offices); McClellan Stores Company (general and executive offices); National City Bank of New York (personal loan division); Detroit Edison Company; Washington Gas Light Company (accounting offices); Sears, Roebuck & Company of Philadelphia (mail-order department); and Thomas Publishing Company.

Production records suitable for office workers are more difficult to obtain than those for factory workers; consequently the results indicating the desirability of music are based on employee responses to a questionnaire. All the surveys conducted by Muzak show that employees are in favor of planned music during work.

There is need for an experiment among office workers of the type that Kerr conducted among factory workers. Apparently employee effort and attentiveness can counteract or vary the influence of periods of music. Although there is not much evidence to support this assumption, it is partly supported by the conclusions in a somewhat related field, noise in work.

### Noise in Work

Noise is generally regarded as a distracter and therefore as interfering with efficiency. In an experiment to determine the effects of noise (*14*), Vernon and Warner had a group of subjects do arithmetic problems and also read material in a book on psychology during alternating periods of noise and quiet. It was found that noise had no appreciable effect on the speed or accuracy of doing arithmetic problems but that there was a slight increase in the expenditure of energy as measured by oxygen consumption. The factor primarily determining whether noise is a distracter is its character—whether it is steady or intermittent. When the noise is steady, the person adapts himself to it; but when it is intermittent, he must make a greater effort to maintain efficiency.

The effect of noise on a job is apparently determined by whether the noise is a necessary accompaniment to the job or not. For example, a typist becomes used to the clatter of the machine because it is a necessary accompaniment to her work, whereas a person working next to her finds this noise an interference. Office workers in close proximity to machines in a factory are disturbed by the noisy machinery to a greater extent than the workers operating the machines.

Some years ago, Morgan conducted an experiment (*10*) to discover

how a person reacts to irrelevant noises. This experiment indicated that at first such noise generally retarded the speed of work, but that this was often followed by an increase in speed. The resulting speed was frequently greater than that achieved prior to the introduction of the irrelevant noises, because the subjects made an extra effort to overcome the effect of the noises. In Morgan's experiment the subjects exerted greater pressure on the keys and evidenced an increase in articulatory reactions. Morgan found that although noise does not necessarily interfere with efficiency as measured by production, it results in inefficiency as measured by energy cost. Ford reports similar findings (7). The only additional evidence indicates that quiet as well as noise can constitute a distraction; thus the quiet that follows the cessation of noise acts as a distracting influence. This was confirmed both by the objective data and by the introspective reports of the subjects. In other words, an employee who has adjusted himself to a noisy work situation may be distracted by a sudden silence.

This does not mean that bigger and better noises should be sought. The evidence indicates that, although production is not curtailed by noise, more energy is expended in the form of increased effort. Also, although quiet working conditions are desirable, it does not follow that silence is necessarily golden.

Sleight and Tiffin (12) reviewed the literature on the subject of industrial noise and point out that the complete condemnation of noise in industry may be unwarranted and that the harmful effects of noise have been overemphasized. It does appear, however, that hearing is impaired by industrial noise and that those subjected to the loudest noises are most affected. This would mean that very noisy work conditions may be detrimental to hearing but ordinary work conditions are not deafening. It also appears as if acoustical treatment to lower noise has more of an effect on attitude than on lowering noise.

Berrien (2) also did a careful review on the effects of noise in work and finds that the popular literature abounds with emotional outbursts on the deleterious effects of noise but the scientific literature rarely supports such views. Apparently adaptation takes place but seldom completely. Under high noise levels, hearing defects are produced after long exposure. Still unanswered, however, are the questions of what levels and for how long.

Summarizing the work reported on noise leads again to an important point. The "common sense" assumption that what is annoying is harmful

and that noise is annoying and therefore harmful should be factually and experimentally determined and not emotionally proved. Noise may lead to production curtailment and deafness in some situations but surely not in all. Noise abatement campaigns should make less noise and stick to the point of being against noise because it is noisy.

### Illumination in Industry

Ferree and Rand of the Research Laboratory of Physiological Optics have conducted much research on illumination and its relation to work. Their findings (*5*, *6*) summarize much of the worth-while information in this field and make possible the following generalizations.

Daylight provides the best illumination for work. Artificial lighting which closely approximates daylight in color and composition is next best.

Important characteristics of lighting which should be taken into consideration are the distribution and location of lights, the intensity of the light, glare, and the combination of artificial light and daylight. The best artificial light is the Mazda or yellow light; this has been found to be superior to the blue glass light, for maximum visibility is obtained in daylight or in lighting that approximates daylight as closely as possible. Artificial light should be as free from color as possible; light that is unbalanced toward any color is a detriment and not a help. Of the colored lights when equalized for brightness and saturation, yellow causes the least discomfort.

Possibly the most important difference between daylight and artificial light is diffuseness. Sufficiently diffuse light tends to produce less glare. Ferree and Rand are somewhat disturbed at the tendency to sacrifice diffuseness of light for high intensities. Excessive intensity and poor diffusion can result in considerable damage to the eye.

One of the most common causes of visual discomfort and fatigue is brightness in the field of vision. Excessive brightness is often due to the source of light or the light fixture. Attempts to solve this problem have been made by devising lamp shades or in some other way shielding the eyes from the glare. A reflector that is turned down gives what is known as direct lighting; the light is directed toward the work area, the walls and ceilings being left dark or very poorly illuminated. In indirect lighting, the light is directed to the ceiling; from there it is reflected to the other parts of the room, especially the work area. This usually results in a disproportionately high brightness for the ceiling and a correspondingly low intensity in the work area. Translucent bowls which reflect part of

the light to the ceiling and transmit part of the light downward have overcome the disadvantages of both direct and indirect lighting.

The problem of unevenness of lighting is clearly brought out in the ordinary lamp. Although the desk lamp may make the work area sufficiently bright and at the same time save electricity costs, it results in a very unevenly lighted room. Most people, while working at a desk, continually look up or away from the work area; this requires continual pupillary adjustment, with resulting fatiguing effects. A makeshift arrangement would provide a lamp in another part of the room, thus reducing the difference in the light at the desk area and in the balance of the room and lessening eyestrain.

Ferree and Rand conducted tests on 550 people; 100 were in each 10-year age range from 10 to 60 years, and 50 subjects were over 60 years of age. Approximately 70 percent of these people preferred less than 15 foot-candles for reading 10-point type; 50 percent preferred less than 11.3 foot-candles. Individual differences are evident in this type of experiment, as in every other in psychology. These authors found a wide variation in the preference expressed in each age group. The people above 35 years of age tend generally to prefer more light for reading than those below 35.

A very important factor in lighting is glare. Glare may emanate from the work area or from the light source. All glare from the light source can be eliminated by the Glare-Baffles devised by Ferree and Rand.

These authors have also conducted useful research to dispel the peculiar notion that the mixture of daylight and artificial light is detrimental (*3*, *4*). Even at present it is generally believed that such a mixture is unfavorable to vision; hence when artificial lighting is needed, some people take elaborate precautions to curtail daylight. Actually, there is no reason for this, because a mixture of the two gives a better and more comfortable light than an equal amount of artificial light alone.

A possible source of this popular misconception may be the difficulty experienced at twilight, when it is neither dark nor light. Anyone who has driven an automobile is especially aware of this. The difficulty is not due to the combination of artificial and natural light; it results from the process of visual adaptation. The eye has been accustomed to bright light and the change in light requires a change in adaptation. As the darkness increases and adaptation to it becomes more perfect, one sees more clearly.

In their experiments on the effects of the color of paper and ink on visibility Ferree and Rand find that black ink on white paper that is free

from gloss is best. White is the best color; saturated colors—saturation is the amount of color in the color—are inferior to unsaturated colors. Darker shades are inferior to lighter shades. When colors are equalized in saturation and brightness, yellow is found to give the best results and an orange-yellow is next; but all colors are inferior to white.

Illumination and color are also considered in the combinations used for automobile license plates. From what has been said, black on white should be best, but road conditions tend to make the white look black—and black on black is not outstanding. Actually, the experiments that have been conducted in this field show that black on yellow is conducive to greatest visibility (here New York, California, and the other states that use this combination score). The greens, blues, and other colors used on other license plates probably are a matter of local pride rather than an aid to visibility.

### Color in Industry

As far as preposterous claims and unsubstantiated allegations are concerned, the so-called "color specialists" are eligible for the "grand prize." An article which appeared in *Popular Science Monthly* in 1947 dealt vividly with the use of color in industry. With reckless abandon it claimed that less fatigue, increased production, and greater safety result from the "scientific use of color in the factory." Some of the stories cited in this article are amazing. For example, as a result of "color conditioning" (whatever that is) one factory is reported to have had an increase of 15 percent in production and 40 percent in accuracy, along with a 60 percent decrease in absenteeism; in addition, "workers take more pride in caring for plant and equipment." This latter may provide a clue to what really happened. If the factory was originally dirty and unpainted and then the painters went to work—providing they were prevented from painting in stripes in hideous hues—it may well be that the employees liked the new conditions of work. But any of a number of color combinations might have had a similar effect. The essential point is how badly the factory needed the paint job in the first place. Any homeowner knows the marvels wrought by a coat of paint inside or outside the house.

This is not to imply that all work involving the color of walls is nonsense. The ability of the surface to reflect light and the contrast between the color of the work area and the wall color may in certain circumstances reduce eyestrain. For example, according to the above article, girls who

inspected blue denim in a textile mill reported that they saw a peach color when they looked at the wall. It is a fact that positive and negative afterimages occur when the eye is overstimulated by one color. If a person looks steadily at a red square for approximately one minute and then looks immediately at a neutral background, he will see a green square on that background. This is a negative afterimage. To return to the textile inspectors who saw "peach," there is no reason to believe that peach was the afterimage, because the negative afterimage of blue is yellow. However, if the blue had green in it, the afterimage may have been a poorly saturated red which might be called peach. The article goes on to say that a "color engineer greatly increased the time the girls could work without strain at this job by providing what their eyes demanded: peach-colored walls."

There is some basis for the idea that blue is a cool color and red a warm color, and interior decorators as well as "color experts" recognize this. Depending upon the illusion to be created, feelings of warmth or cold may be encouraged by the use of these colors. But it is unlikely that the introduction of these colors will compensate for even a five-degree change in temperature.

An example of work that is definitely the cause of skepticism is a report of an interview with Faber Birren on the occasion of the publication of his book *Color Psychology and Color Therapy.* According to the report Birren maintains that "the right illumination and right color are worth $139.25 annually an average employee in American industry." "Sounds like a bargain at a reduced price" appears to be the only appropriate comment this writer is capable of making. According to Birren, yellow is the color of intellectuals, blue is the favorite of introverts. Again a comment seems appropriate and it is "Want to bet?" In addition, what happens when a person is equal parts intellectual and introvert?

The evidence on the relation between color in industry and increased production is primarily based upon data that have not been subjected to rigid experimental tests. Consequently this field must be considered a greater unknown than music, noise, or illumination.

### Miscellaneous Factors

A cafeteria is often installed in a plant because of necessity. A factory at some distance from restaurants or other eating places will have to have a cafeteria in order to attract and hold employees. However, a cafeteria

is likely to become a thorn in the side of management. An insurance company in New York City supplies hot lunches to its employees; the meals are wholesome and provide a thoroughly balanced diet. But to induce employees to eat in the cafeteria this company has a rule forbidding them to get their coats until the end of the day. Consequently, even on the coldest days employees can be seen dashing from the building without coats to go to the nearby soda fountain for a sandwich, a cigarette, and an ice-cream soda. Complaints about food, especially when it is supplied by the company, are very common. Hence most industrial cafeterias are a source of employee dissatisfaction as well as overhead cost. Even so, they are sometimes necessary as an environmental change.

A novel solution to the cafeteria problem has been proposed by Douglas Aircraft Company. It has 12 mobile cafeteria trains (see Fig. 13.4). These facilities can feed 6000 employees during a single 30-minute lunch period. Each food train travels to a dining area and becomes a two-line cafeteria.

A new fad in industry is the "snack bar" or modified canteen. Factory employees apparently like a chance to insert a nickel in a juke box and drink a coke out of an automatic dispenser during a rest pause. Here again, however, it must be remembered that the employees' attitude toward environmental change will determine whether such a change will be accepted or rejected. A rest pause spent in a canteen is apparently more favored than straight relaxation. It promotes social activity.

The drinking fountain with its cool bubbling water sometimes provides the employees with an excusable rest period that, especially during warm weather, is relaxing and refreshing. Employees resent the fact that drinking fountains may not be located near enough to the work area, but a small capital investment often solves this problem.

The greatest bone of contention among many employees is the condition of the rest rooms. The amount of space devoted to the rest rooms, as well as the sanitary conditions, are important contributors to employee attitudes. When such facilities are inadequate or lacking, this may have a serious effect on job performance.

There are many other environmental aspects of a job that are related to the ultimate attitude of the employee and the morale of the group. Although few if any experiments have been made in this field, no claims as wild and weird have been made as those made in connection with color in industry.

In closing this chapter the reader is reminded of the Hawthorne Studies
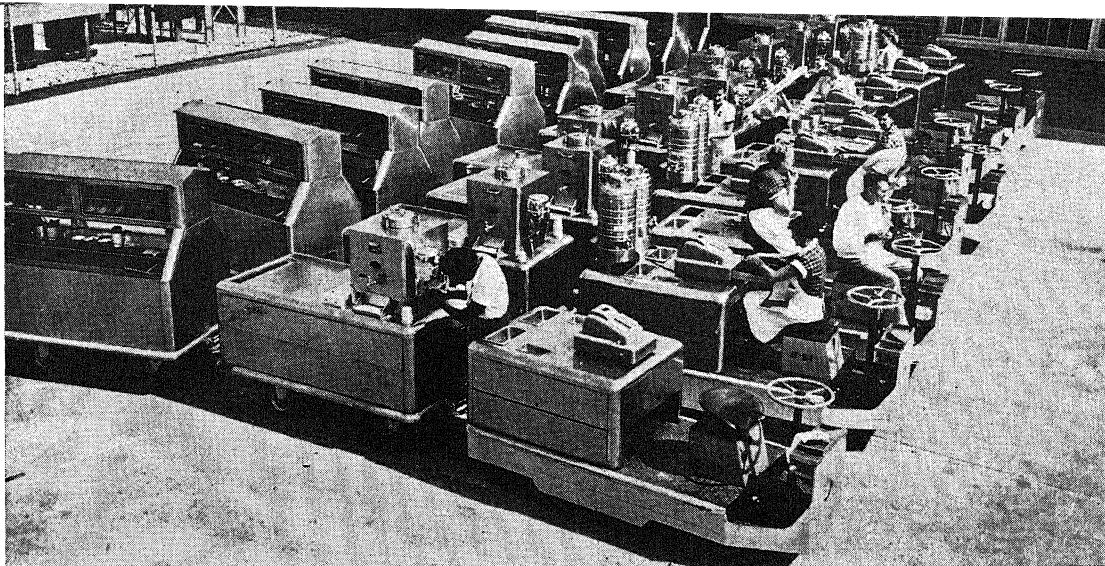
*Figure 13.4.* Mobile Lunch Carts Solve the Cafeteria Problem. *Top:* Cafeteria trains ready to meet the lunch rush. *Bottom:* A lunch cart in action within the plant. (Courtesy of Douglas Aircraft Company, Inc.)

reported in Chapter 2. The experiments on illumination suggested the danger of overlooking employee attitudes and morale in attempting to relate changes in production to different environmental conditions. In addition, these studies showed the relationship between production and the interpersonal relations of employees. The foreman, the supervisor, the boss, the "expert" all play an important role as individuals and help to determine the employees' perception of the change in the environmental situation. These people may contribute to an increase in production as much as a new environmental factor does. Change in work environment should be considered not as a separate entity but rather in relation to interpersonal relationships of employee and employer.

### Summary

Numerous environmental changes are possible slight aids to increased production and efficiency. Sometimes they are effective because they directly produce greater efficiency, and sometimes because they contribute to more favorable employee attitudes, which ultimately results in increased efficiency. A popular environmental change involves music in industry. Slight but nevertheless consistent increases in production occur under certain circumstances. Approximately 5 percent is the maximum increase that can be reasonably expected; in most circumstances the increase will probably be less. But spoilage is also likely to increase; hence the decision as to whether to make music available will depend upon the ratio between the increase in production and the increase in spoilage. Music broadcast for definite short intervals is apparently better than music from a radio that is on all day.

Effective illumination increases visibility because of the more even distribution of light and the elimination of glare. Daylight is the best light; artificial yellow light is better than other colors.

Although substantial claims are made for the importance of color in industry, there is at present no clear-cut experimental evidence to support these claims. Noise increases an employee's effort but does not necessarily decrease his production. Noise that is intermittent or not a necessary accompaniment to the job decreases efficiency more than does steady noise or noise directly related to the job. The deleterious effects of noise seem to be more related to attitudes than to deafness.

Among the many miscellaneous environmental factors that can contribute to greater efficiency provided a favorable attitude toward them is maintained are the cafeteria, the rest room, and the drinking fountain.

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CHAPTER 14

# Fatigue and Other Phenomena

FATIGUE is a subject that interests both the employer and the employee. Since a decline in the curve of production is often attributed to the worker's fatigue, the employer would like to eliminate this decline by eliminating fatigue. The employee recognizes fatigue as a feeling of tiredness or pain; he regards it as intrinsically unpleasant, and so he too is interested in its decrease or elimination. For these reasons, industrial fatigue, despite its elusive nature, has been the subject of many investigations, from both a physiological and a psychological point of view. Many topics in industrial psychology are directly or indirectly concerned with fatigue. One of the goals of time and motion study is to reduce the effects of fatigue in workers by introducing more efficient work methods. Evidence indicates that proper training results in correct work methods which can do much to prevent the onset of fatigue. It is also recognized that effective motivation can be successful in eliminating fatigue or at least in reducing its effects. A relationship has been found between accident rate and fatigue.

The word "fatigue" is widely used and misused. Practically all physiologists and psychologists recognize the diverse factors involved in this concept. Sometimes fatigue of a physical nature is differentiated from fatigue of a psychological nature. This leads to the use of the term "fatigue" as differentiated from the term "mental fatigue." Monotony, boredom, and other similar phenomena in industry are in some respects similar to fatigue, at least as far as reduced production is concerned. Although such terms are sufficiently different so that anyone knows in personal situations when he is fatigued or tired as compared with when he is bored, in industrial situations there is often confusion between these two concepts. The industrial psychologist studies fatigue not so much to understand its physiological basis as to be able to eliminate as many of its

effects as possible, and thereby maintain or increase production and job satisfaction.

## Fatigue: What Is It?

Investigators working in this area are in general disagreement as to the nature of fatigue, and many are perplexed by the diverse character of the concept. According to Dill (7):

> We can say that fatigue is not an entity but merely a convenient word to describe a variety of phenomena. The common fallacy of supposing that the word fatigue corresponds to a definite thing has been a source of much confusion. Fatigue from short bursts of activity whether by the whole body or by isolated muscular groups, is characterized by increase in lactic acid and temporary inability to continue. Fatigue from depletion of fuel reserves does not occur commonly in man, but when it does, chemical analysis of the blood reveals a low level of blood sugar. Fatigue from working in a hot environment has several manifestations, the most simple to measure being the increase in heart rate. Finally in the instance of two individuals doing the same task, one may become more fatigued than the other because the poor nervous coordination of the unskillful man makes it necessary for him to expend more energy than the other. In general, fatigue from any of these causes is greater the more nearly the individual approaches his capacity for work.

In an intensive study called *Fatigue and Hours of Service of Interstate Truck Drivers* (8), the term "fatigue" is defined as an altered psychological and physiological state in relation to the status of recovery or normal capacity. Muscio (21) defines fatigue as "a condition caused by activity in which output produced by that activity tends to be relatively poor and the degree of fatigue tends to vary directly with the poorness of output." Muscio, however, is himself dissatisfied with this definition because fatigue cannot be directly measured and because diminished output may also be a result of distraction. He concludes that the term "fatigue" should be banished from scientific terminology. But banning the word would still leave the phenomenon that by any other name would still be fatigue. It would be pointless to argue with a fatigued worker that there is no such thing as fatigue because fatigue does not stand the rigors of scientific tests and standards.

Whatever fatigue is, it is safe to say that any muscular work, even that involved in sitting in a chair, will result in fatigue provided the work of the muscles and the resulting expenditure of energy are at a faster rate than recovery is. The major difficulty in understanding the true nature of fatigue is caused by the fact that many factors in addition to muscle use

contribute to its onset. The length of the work period, the speed of work, the extent of the musculature involved, and the tensions accompanying the task are a few of these factors. Further complications are caused by the fact that industrial fatigue rarely concerns a single muscle but rather the individual as a whole. Depending on the strength, stamina, and preparation of the individual, fatigue is manifested at different rates in different people.

In some respects no one can ever hope to eliminate fatigue from work unless the work can proceed at the exact rate at which recovery takes place and all the other factors contributing to fatigue can be eliminated. And yet some people set their pace on the job so that recovery seems to take place faster than the onset of fatigue. Half seriously, this might explain the stenographer who comes to work in the morning very fatigued but somehow manages to gain energy during the day so that she is able to keep her date in the evening, only to be fatigued the next morning. This must not be regarded as fatigue; it is a phenomenon related to fatigue that will be discussed later in this chapter.

Psychologists can help to eliminate much of the unnecessary fatigue that is caused by unfavorable conditions on the job. Inefficient work spaces, inefficient work methods, inefficient tools, and inefficient people to do the work cause much unnecessary fatigue. These causes can be attacked and conditions changed so as to eliminate or reduce much fatigue on the job.

A simple approach to an understanding of fatigue has been the study of it in the laboratory. An early study of this nature was conducted by Mosso (*20*) in 1890. He constructed an ergograph to record and measure the work done by the muscles in flexing a finger. By attaching a weight to a string tied to a finger and strapping the hand so that only this finger was allowed to move, it was possible to obtain a sample work or fatigue curve. Using this technique, Mosso demonstrated the rate and extent of the work that could be done by a single finger lifting a specific weight. He was also able to demonstrate that if a fatigued muscle is forced to work, the period of recovery is prolonged. Thus if a few minutes is required for recovery after a 10-minute work period but the work period is nevertheless increased to 15 minutes, recovery requires more than one and a half times the time required after the 10-minute work period. Although Mosso's ergograph does study fatigue, it has the obvious disadvantage of doing so under extremely unnatural conditions; furthermore, no job in industry is likely to require the movement of only one finger.

Vernon (27) developed a variation of the dynamometer which enables one to study the effects of work when the larger muscles of the body are involved. His apparatus requires the subject to pull with both hands on a handle attached to a spring balance; the pull on the balance is recorded by a pointer on a revolving drum. With this apparatus Vernon was able to show that the strength of the pull varies with the height of the handle. He also demonstrated that the introduction of rest pauses increases the capacity for work, and further, that a change of posture during the rest pauses helps recovery to a greater extent than merely stopping work. Vernon's study has a more direct bearing on various industrial jobs and is a strong argument in favor of introducing rest pauses during the work period. It also recognizes the benefits to be derived from encouraging employees to change their posture from that normal during the work period. Many other studies of a similar nature have been made in the laboratory, but each has the disadvantage that the subject is not actually working on a job. Inferences drawn from the laboratory studies may not apply to industry because differences in work speed, pace, and continuity may exist.

### Industrial Studies of Fatigue

Crowden (6) classifies muscular work in industry into three general types. The first is heavy muscular work that is too strenuous for a steady continuous rate of work to be maintained. Examples of this type of work are loading trucks, building roads, and possibly mining coal. The second consists of moderately heavy work that is continuous and in which the rate of expenditure of effort is much lower than in the first type and is somewhat balanced by the rate of recovery. Examples of this type of work include machine tending and many other kinds of factory work. The third type of muscular work in industry is the light, speed work which involves a relatively small expenditure of energy but which often requires a postural strain that causes unnecessary fatigue. Office work is a typical example.

Crowden found that in a fifty-yard barrow run the worker expends approximately 8 percent of his energy in raising and lowering the handles, 22 percent in attaining a wheeling speed and in stopping, and the remaining 70 percent in the run itself. This study shows the tremendous inefficiencies that would result from interfering with the run once it is started. In studying the energy cost of moderately heavy work, Bedale (2) found that carrying a load with a yoke as a milkmaid does is the most

economical method from the point of view of expenditure of bodily energy. Any method of carrying weights which requires postural strain and displacement of the body when walking is more costly. Crowden reports that light, speed work involves little expenditure of energy but that there may be considerable fatigue because of the cramped or uncomfortable position maintained by the worker. Measurement of the actual expenditure of energy does not give a measure of fatigue with Crowden's method because his measures basically the oxygen consumption in excess of normal.

The tremendous difficulty of the problem of fatigue is vividly illustrated by the research on the relationship between fatigue and hours of work of interstate truck drivers done by the United States Public Health Service in one of the most valuable studies in this field. The purposes of this study were (1) to determine if various periods of truck driving would produce demonstrable and significant psychophysiological changes; (2) to investigate the nature of these changes; and (3) to discover whether a characteristic pattern of psychophysiological response occurs after long hours of driving, i.e., the syndrome "drivers' fatigue."

The sixteen factors which were considered as contributing to fatigue in truck drivers were:

1. Performance of a skilled operation requiring a high degree of alertness and attention.
2. Nervous strain due to driving under adverse conditions.
3. Muscular exertion in loading and unloading and in the repair and maintenance of vehicles.
4. General irregularity of habits as a result of long-distance hauls.
5. Failure to obtain satisfactory rest or sleep during rest periods or when off duty.
6. Physical condition.
7. Constant use of the eyes, frequently under unfavorable conditions such as glare, etc.
8. Social factors in the environment or occupational tradition possibly promoted by enforced absence from home.
9. Monotony inducing sleepiness.
10. The consumption of coffee and alcohol.
11. Exposure to all types of weather conditions.
12. Exposure to toxic fumes and gases.
13. Economic insecurity, that is, fear of losing one's job especially in the case of older men.

14. Noises.
15. Vibration.
16. Sedentary occupation—the effect of posture.

In this study a total of 889 drivers in three cities—Baltimore, Nashville, and Chicago—were given a comprehensive battery of tests. The investigators took no sides in the controversy as to which type of test best measured fatigue, but used both simple and complex performance tests and also included non-performance tests in their battery.

Whereas performance tests measure ability to do a given task, non-performance tests measure bodily states over which the subject has little or no voluntary control. An impartial observer will readily concede that each of the two types of test used in the measurement of fatigue has its advantages and disadvantages, and that both should be used. However, they have been the subject of considerable debate among those attempting to measure fatigue. One of the advantages of a performance test is that it directly measures a function in relation to the specific task—hand steadiness, for example. Another is that it can detect relatively slight degrees of fatigue more rapidly than most non-performance tests. The disadvantage of performance tests is that they can be influenced by the motivation and attitude of the subject.

The advantage of using a non-performance test is that it is based entirely on chemical and physical changes which, in most cases, cannot be brought about deliberately by the subject. The disadvantage is that emotional states which have nothing to do with fatigue may, in certain instances, cause similar chemical and physical changes and so the test may measure not fatigue but an undetermined emotional state.

The complete battery included the following:

I. Psychological tests.
   1. Spatial perception (the estimation of known sizes).
   2. Manual steadiness.
   3. Precision of movement (aiming).
   4. Reaction-coördination time.
   5. Reaction time.
   6. Speed of tapping and work decrement.
   7. Strength of grip.
   8. Static equilibrium (postural steadiness).

II. A series of tests using the De Silva driver vigilance test apparatus, consisting of accelerator-brake-foot reaction time, steering efficiency, and a combination of starting efficiency plus brake reaction (this apparatus is described more fully in Chapter 17).

III. Tests to measure resistance to and recovery from glare.
IV. Tests to measure the speed of eye movement (see Fig. 14.1).
V. Tests to determine the critical fusion frequency following exposure of the eye to flicker at two levels of illumination.
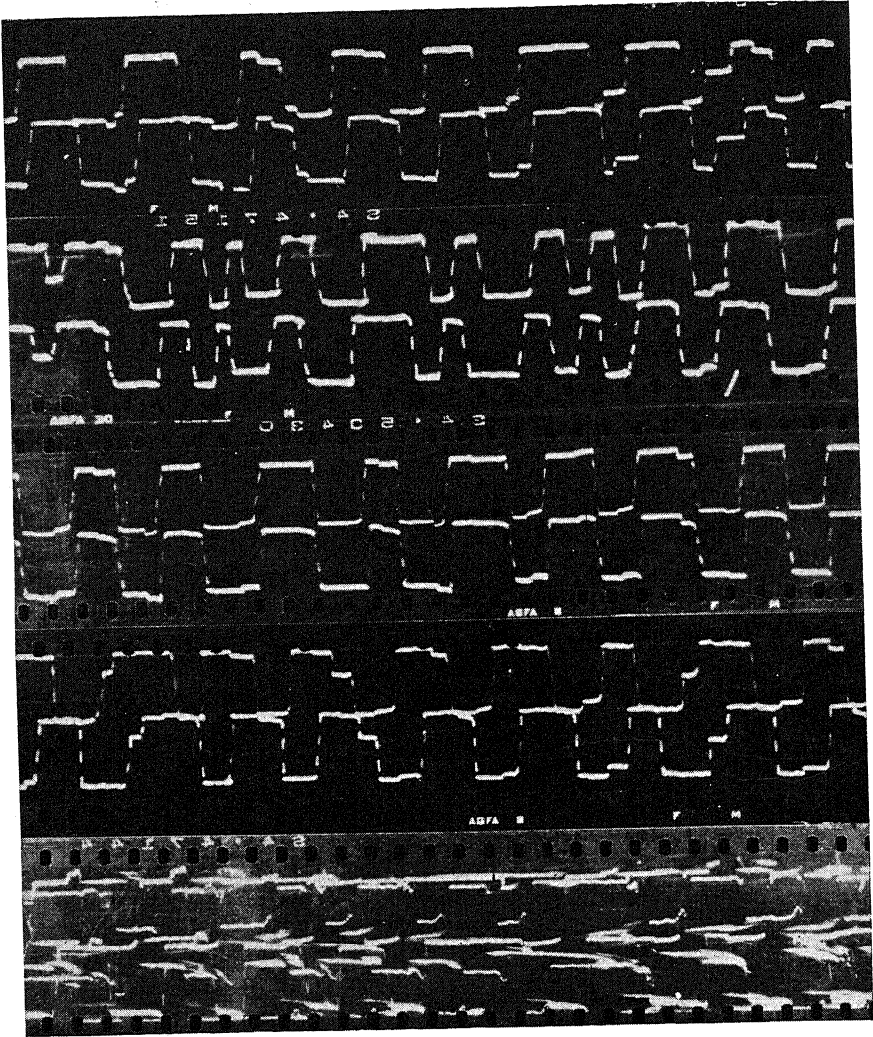
*Figure 14.1.* Opthalmograms of Truck Drivers. The dotted lines are saccadic movements and the solid lines are fixations. (From *Fatigue and Hours of Service of Interstate Truck Drivers,* Public Health Bulletin No. 265, Federal Security Agency, U.S. Public Health Service, Washington, Government Printing Office, 1941.)

VI. Snap acuity test.
VII. White blood cell count.
VIII. Concentration of potassium and total base in blood serum.
IX. Determination of carbon monoxide content of blood.

In addition to these tests, a thorough medical examination was given. Also included in the data was an occupational and habit study of the drivers.

The major findings of this study do not present the clear-cut conclusive evidence that one would like; but there is no real reason to believe that such information can be forthcoming with the measures of fatigue that are known at the present time. The investigators state, "It appears that a reasonable limitation of hours of service of interstate truck drivers would reduce the number of drivers on the road with low functional efficiency. This, it might reasonably be inferred, would act in the interest of highway safety." The test results showed that the men who had not been driving just prior to being tested had the highest average efficiency, those who had driven less than ten hours had the next highest average efficiency, and those who had driven over ten hours had the lowest average efficiency, in the following seven functions:

1. Speed of tapping.
2. Reaction-coördination time.
3. Simple reaction time.
4. Manual steadiness.
5. Body sway.
6. Driving vigilance.
7. Ability to distinguish flicker.

The men who had been driving prior to being tested performed less efficiently on the average than those who had not driven, on tests of the following three functions: (1) aiming, (2) resistance to glare, (3) speed of eye movement. The data on these three tests, however, do not differentiate consistently between drivers who worked from one to ten hours and those who worked over ten hours. In items 1–7 this difference does occur. Heart rate decreased slightly with hours of driving. The average white cell count was higher in men who had driven than in men who had not driven since sleeping. No relationships were found between hours of driving and ability to estimate the size of known objects, differential white cell counts, hemoglobin content of the blood, acidity of urine, specific gravity of urine, visual acuity, and the total base and potassium concentration of blood serum.

There was a relationship between the men's subjective estimate of fatigue and the objective measure provided by some of the tests.

Driver reactions under prolonged loss of sleep are reported by McFarland and are discussed in Chapter 17. The illustrations in Figure 14.2 are relevant and indicate that efficiency can be impaired.

Ryan (23) in studying the concepts of work and efficiency rightfully prefers to consider the relationships between cost and energy of input and output. In his book he admits, "These chapters on the fundamental problems of efficiency [as he sees them] have raised more questions than they have answered." For practical purposes it does appear as if the concept of fatigue, though interesting from a physiological and laboratory point of view, leads to little progress in better understanding the involvements in the day-to-day work situation of a typical man.

### Related Phenomena

If fatigue is regarded as elusive and difficult to measure, mental fatigue must be regarded as much more so. After preparing a lengthy assignment, college students often insist that they cannot possibly read another page; they are exhausted and must go to bed. If, at that particular moment, the telephone rings and an attractive date is in the offing, the fatigue caused by this "strenuous" mental activity goes out the door with the student. The question is: Was there any mental fatigue in the first place?

Mrs. Gilbreth said in a speech that girls with dates suffer less from fatigue than girls that have no dates. It is not necessary to wax philosophical in a book on industrial psychology, but mental fatigue implies that such "stuff" exists, apart and distinct from the physiological realm. This, according to present-day science, cannot be taken too seriously. Undoubtedly, the major component of mental fatigue is attitudinal; the physiological component is surely not sufficient to resemble the fatigue measured by available performance or non-performance tests.

In an experiment on mental fatigue (*14*), three subjects worked for a 12-hour period on four successive days multiplying four-place numbers by four-place numbers. Each problem was solved without the aid of pencil and paper and only the answer was recorded. If anything could cause mental fatigue and even a certain amount of physical fatigue, an experiment such as this should have produced it. However, little evidence to support this was uncovered. Even though the subjects had had extensive practice prior to beginning the experiment, all three showed an in-
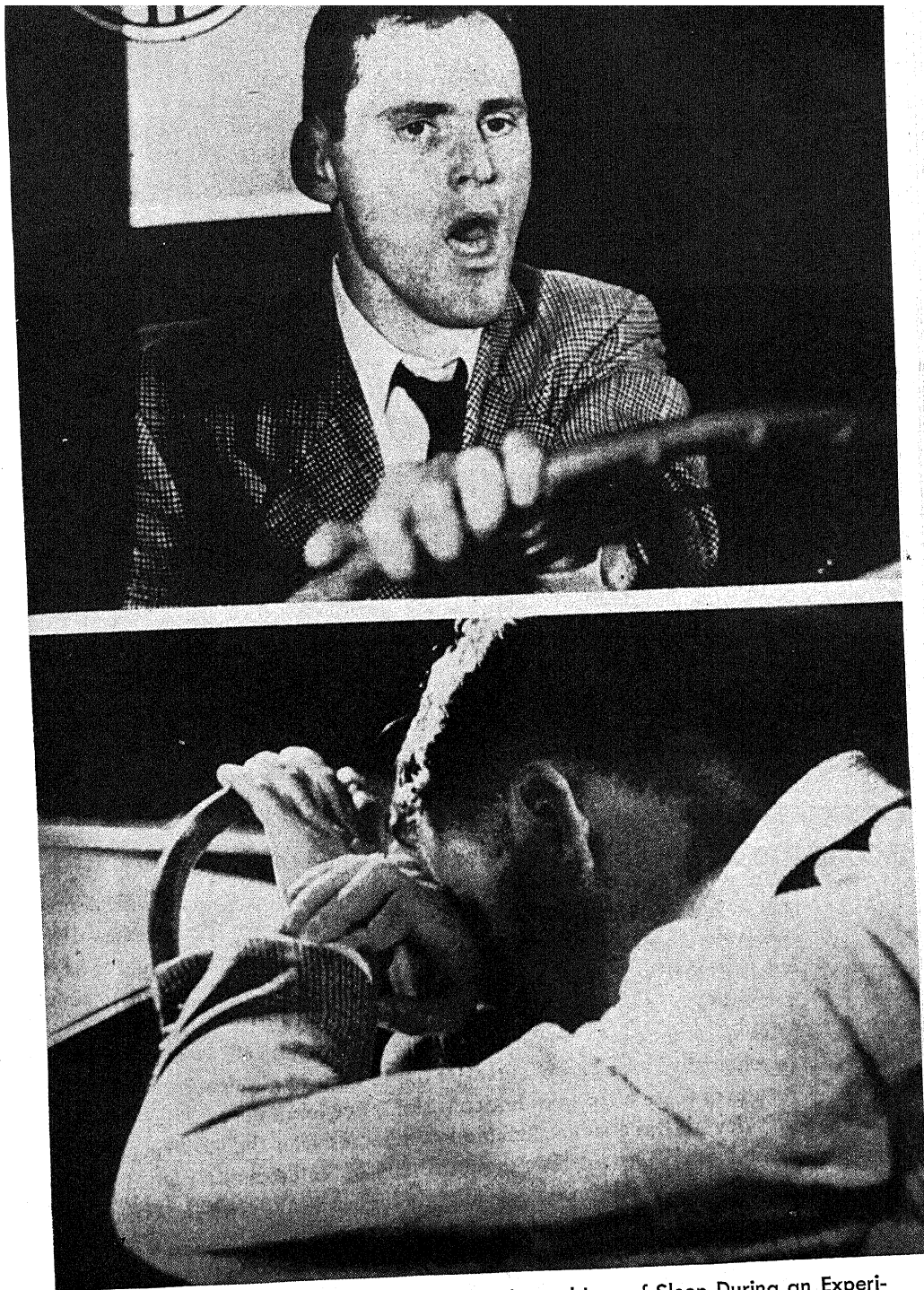
*Figure 14.2.* Driver Reactions After Prolonged Loss of Sleep During an Experiment Designed to Measure Performance Under Conditions of Extreme Fatigue. (From R. A. McFarland and A. L. Moseley, *Human Factors in Highway Transport Safety*, Boston, Harvard School of Public Health, 1954.)

crease of speed in mentally multiplying four-place numbers. It was found that the effect of continued mental work was associated with an increase in the percentage of error. One subject scored 38 correct answers out of 80 on the first day, and 33 correct out of 115 on the fourth day. The other two gave similar results. The work curves for all three subjects (Fig. 14.3)
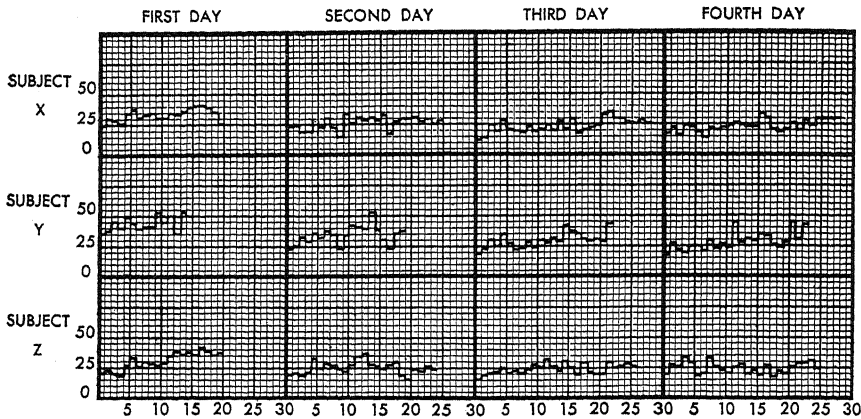
*Figure 14.3.* Work Curves of Subjects Performing a Difficult Mental Task. (From Psychological Monographs, by permission of the American Psychological Association.)

are relatively flat and do not show the theoretical characteristics of either fatigue or monotony curves.

"Despite conclusive, objective evidence that feelings of intense dislike, ennui, boredom to the extent of headache and illness, dizziness, nervous instability and physical and muscular weariness were accompanied by some decrease in mental efficiency, one would not venture a guess as to what extent the decrease was attributable to divided attention or to mental fatigue per se."

In addition to this rigorous mental task the subjects took a battery of psychological tests before and after the 12-hour multiplication period. The results of these tests were not consistent. For example, at the close of the first day all three subjects made lower scores after the 12-hour period of mental work; this suggests the possibility of "transferred fatigue." But on the second day all three made slightly higher scores after the ordeal, and on the third day the results were erratic and contradictory. With reference to the non-performance tests, all three subjects displayed few conclusive signs of unusual physical fatigue as revealed in measures of ab-

dominal and costal respiratory movements, metabolic rate, pulse, temperature, weight, recording of blood content, and urine analysis. The authors conclude: "Despite subjective states of physical fatigue and overwrought nerves recognized by all three subjects, the records showed little indication of physical fatigue except for the rise of metabolic rates during the third and fourth days of the fatigue series. Even these metabolic rates had returned to normal on the morning of the day following the experiment." The notes of one of the subjects best summarize the subjective results. She wrote, "Isolation, hard work, etc., made entire four days seem like one long nightmare to me. I marvelled that the other two girls seemed to hold up so well. Would not repeat these four days for ten thousand dollars, I believe."

This experiment and its findings must create considerable doubt as to the existence of mental fatigue as an entity. As a feeling, it undoubtedly exists. However, no physiological changes took place and measures of performance did not show any decrement.

However, Geldreich, conducting an experiment in mental tasks, obtained rather different results (9). He subjected 10 persons to the simple task of manual naming one of five colors—red, yellow, green, blue, and white. The actual task lasted 55 minutes and was repeated over a number of days. Experimental design was planned to include all necessary controls. Geldreich found that the production in the last five minutes was 14 percent less than in the first five minutes. Also found were increases in heart beat, respiration rate, blood pressure, and skin conductance during the performance of this task.

This study would tend to support the view that mental tasks result not only in a work decrement but also in physiological changes and in general disagrees with the findings reported in the previous study. Thus the last word and final answer to the question of the existence and effects of mental fatigue remains to be offered in the future.

Possibly the largest component of mental fatigue is the tension and attitude usually accompanying a task that an individual regards as a challenge. Writing an examination paper for three hours, were no tensions involved, would be no more fatiguing than writing a letter to a friend. Tension is not only a psychological but also a physical entity. A person can continue extremely difficult mental tasks without any dire effects much longer than is ordinarily believed. The Huxtable experiment clearly illustrates this point, but the Geldreich experiment on a much simpler task did definitely show work decrements. The clue to the differences in

results may be that for college students color naming is not as challenging as mental multiplication. Motivation and boredom are sometimes overlooked as variables in experimentation. Results from many different sources indicate that physiological differences may be a result of motivation or emotion as well as of physical tasks.

A study on the subjective feelings of tiredness during each half-hour of an eight-hour workday (*11*) for manual workers (N = 232), office workers (N = 73), and supervisors (N = 75) reveals considerable similarity in the morning periods and some similarity in the afternoon periods. The peculiarity of maximum "tiredness" prior to the lunch hour raises the question that the feeling of tiredness may not be an indication of fatigue at all. One should expect more fatigue, if it exists, in the afternoon or at least at the day's end. Figure 14.4 presents the curves as found by Kerr et al.
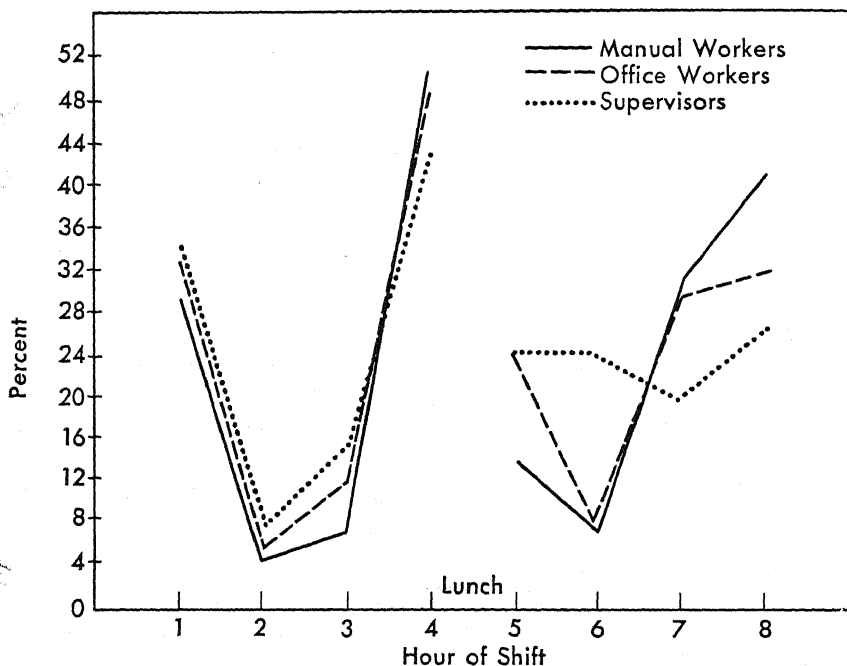
*Figure 14.4.* Percent of Manual, Office, and Supervisory Employees Reporting Maximal Feelings of Tiredness at Each Hour of Each Half of the Eight-Hour Work Shift. (From J. W. Griffith, W. A. Kerr, and T. B. Mayo, Jr., Changes in subjective fatigue and readiness for work during the eight-hour shift, *J. Appl. Psychol.* [1950], *34*:163–166. By permission of the American Psychological Association.)

Another phenomenon related to fatigue is monotony or boredom. The outstanding characteristic of monotony is the fact that it is dependent upon the individual rather than the job. The girls assembling relays in the Hawthorne Studies showed little evidence of monotony despite the extremely repetitive nature of their job. A story is told about a champion orange packer—in other versions it is an electric bulb packer or someone else. (Chances are it never happened, but it illustrates the point.) In a certain state a contest was held to determine the fastest orange packer. He was to be designated "king" or "champion" with much fanfare. After a series of preliminaries, quarter-finals, and semi-finals, the final was held and the champion selected. This man worked at a fast, steady, almost furious pace. But of course he finally stopped work long enough to be interviewed and he supposedly reported that he found the job very challenging. For one thing, he did not regard oranges as all alike; they differed in size, color, and texture. Furthermore, when he saw an empty crate in front of him, he had a strong desire to fill the emptiness by putting in the first layer as rapidly as possible. When this layer was finished, the motivation was strong to complete the second layer and finally the last, so that the crate could be taken away and a new one brought to him. To this person, if he ever existed, orange packing is not a monotonous job.

In determining whether a job will be regarded as monotonous by an individual, his intelligence, his interests, and his personality must be investigated. People who are too intelligent or not intelligent enough for a certain job often find it monotonous. Those who would rather work with other people find a job in which they work with things monotonous; conversely, a person who would rather work with things dreads the thought of dealing with people. Interest in an occupation or profession enables one to find challenging situations in it which a disinterested person could never find or understand. Occasionally the author meets former students of his who, after the usual exchange of niceties, ask, "Are you still teaching?" And next, "Are you still teaching the same course?" To the author, each semester and each section presents a very different problem and so teaching is not quite as monotonous for him as these former students seem to believe.

Much has been written about the effect of specialization and simplification of work. People are supposed to prefer varied rather than uniform or repetitive tasks. This is not true to the extent that is ordinarily believed. The average individual gives lip service to the importance of and need for

variation in work and life in general but merrily performs as many tasks as possible in a routine fashion. For example, people who ride on the subway in New York City have little need to travel on the same train each morning, since trains are likely to run just a few minutes apart. Yet many people who claim they desire variability in their work walk to the station by exactly the same route and enter the same door of the same car, day in and day out. People are likely to eat in the same restaurant every day; many prefer to sit at the same table each time. Examples of the desire and preference for uniformity of tasks are endless. Many people prefer a job with a minimum of responsibility. Jobs that are varied sometimes require decisions that may get the person into trouble, whereas routine jobs are "safe" jobs. For some people, a uniform task is a boon and not a boomerang. The only job that is monotonous is the one which the worker who does it regards as monotonous and this is true regardless of the occupational level.

As we saw earlier, fatigue, assuming that it does exist in industry, can be reduced by shortening the working day, by introducing rest pauses, and by providing more efficient environmental factors on the job. Monotony can be reduced by a more careful selection of personnel—by attempting to hire the person with the necessary intelligence for the job and rejecting those with too much or too little. Consideration of the job in relation to the personality of the individual often makes for a situation in which there is no clash between the individual and his tasks.

Just as rest pauses reduce fatigue, so are they useful in reducing monotony. A rest pause often provides a necessary break in activity and just the change the worker needs to combat monotony.

From the point of view of reducing monotony, job changing is important. Employees very often change jobs, even against company rules, in order to combat monotony. Good supervision demands that such changes be noted, studied, and possibly encouraged. In many cases the rule against changing jobs is the result of an incomplete definition of efficiency in the first place. Many jobs can be made more interesting provided meaning is attached to the work. By this we do not mean assuming a "Pollyanna" attitude and attempting to create meaning where no meaning exists; workers are too smart for these tactics. However, explaining to the worker what his task is in relation to the organization as a whole often gives him a sense of the meaning of his job that he could not have gained by himself.

Another way to combat monotony is to provide social and recreational

activities. Some organizations carry this to such an extreme that a man's job sometimes seems merely a fill-in between one bowling contest and the next. However, there is no doubt that many workers look forward to the few minutes they can spend in the canteen smoking, talking, and drinking soda.

### Hours of Work and Production

The crux of the problem in industry is not really the presence of fatigue or monotony but the relationship between an employee's hours of work and his production. There is widespread misunderstanding and confusion about this relationship. It is generally believed that the way to increase production is to increase the number of working hours. During periods of unemployment it is widely believed that the way to spread employment is to shorten the work week. Both these views are "common sense"—and faulty. Stated most simply, increasing the hours of work usually decreases production. The corollary is also true: decreasing the hours of work usually increases production.

As we all know, a tremendous increase in production occurred during the war years. This developed in spite of the increased hours of work, rather than because of them. The real problem is not the number of hours of work in relation to production, but the relationship between the real and the nominal hours worked. Bold recognition must be given to the fact that in any work week a difference exists between the actual hours of work and the nominal hours of work. Further, studying the relation between actual and nominal hours in a work week uncovers that each does not increase or decrease in a constant time manner.

Many prominent labor-management leaders, who are quite important and generally well informed, indicate their lack of awareness of this phenomenon. For example, C. E. Wilson, formerly president of General Electric, in 1950 called for a temporary 45-hour week to boost defense production without cutting consumer goods. In addition, Mr. Wilson saw this technique as a way to avoid inflation. As might be expected, CIO and AFL leaders rejected the proposal that overtime pay start at 45 hours rather than 40 hours.

It does appear as if the work week length is a "football." A more calm consideration reveals that a certain number of actual hours are worked in a nominal week and that the optimal relation establishes the highest number of actual work hours in relation to the total or nominal week.

The length of the working day has become an emotional problem.

Unions have used a shorter workday as an indirect means of increasing wages. Some businessmen have expressed great concern over what the employee will do with this new leisure time; others believe that a shorter workday will force them out of business. Both groups tend to overlook the important point—how many hours a person actually works during the workday. Very often, a decrease in the nominal hours of work does not in any way affect the actual hours worked. Nominal hours are defined as those between punching "in" and "out" on the time clock. There is a difference between these hours and the actual hours worked; any employer or employee knows this. Unproductive working time, rest pauses, tardiness, early stoppages, absenteeism, changes in work pace must all be considered. It is these factors, as well as others, which create the discrepancy between the nominal and the actual hours of work.

It is a fact that as nominal hours increase, the proportion of actual hours worked to nominal hours decreases, and that as nominal hours decrease, the proportion of actual hours to nominal hours increases. This principle must be remembered, for not until it receives the proper attention will much erroneous thinking be prevented. Rex Knight (*16*) reports a number of typical illustrations of this principle. In one instance when nominal hours were reduced from 63¼ to 54, actual hours fell only from 56 to 51. In another case, when nominal hours were reduced from 62.8 to 56.5, actual hours rose from 50.5 to 51.2. In a third case, the amount of time lost through sickness was 2.8 percent of a 46-hour week. This rose to 3.85 percent when the nominal hours were increase to 54, but dropped to 2.7 percent when the hours were reduced to 46. In still another study reported by Knight, the nominal hours were reduced from 74½ to 63½ and the actual hours fell from 66 to 54.4. However, since the hourly output increased by 21 percent, the total output remained unchanged. The reduction of nominal hours continued and finally there was an increase of 13 percent in weekly output, although the actual hours had been reduced 18½ hours.

In one other study, 2⅔ hours overtime was added to the normal 10-hour day. The hourly output fell by 6.5 percent on the day overtime was worked and 3.9 percent on the following day.

A survey made by the U.S. Department of Labor (*13*) in 12 metal-working plants found that the 40-hour week and the 8-hour day yield the highest output for each hour worked. More than 40 or 48 hours a week resulted in additional output but with constantly decreasing efficiency and with increasing absenteeism as the hours were stepped up.

Employees doing light work under wage incentive systems and with weekly schedules ranging between 55 and 58 hours have achieved the equivalent of approximately two hours' output for every three hours worked over 48. On heavy work, the ratio was more nearly one hour's output for every additional two hours' work. This survey also gathered data indicating that the 7-day week as a steady program is uneconomical and may actually result in lower production than the 6-day week.

The primary effect of lengthening the workday for employees working a 5-day week is to wipe out the midweek spurt in production. Analysis of daily production records in several plants on a 40- to 48-hour schedule shows a building up of hourly efficiencies toward a peak on the third or fourth day of the week, and a slight drop thereafter. When the workday was lengthened to 9½ hours or more, this peak disappeared. The data indicate clearly that workers adjust themselves to a longer workday by slowing down.

This study also found that when a sixth workday was added to bring the work week up to 58 or 60 hours, the result was likely to be a steady decline in the efficiency level every day, with the peak points occurring on Monday or Tuesday, that is, at the beginning of the week.

In a further study reported by the U.S. Department of Labor (*12*) it was found that all else being equal the 8-hour day and 40-hour week are best in terms of efficiency and absenteeism and that higher levels of hours are less satisfactory. Since this was a study of 78 cases covering 2445 men and 1060 women in 34 plants, it must be inferred that the investigators did not have ample opportunity to study shorter work weeks. They also found that longer hours yielded higher output but at increased unit costs. Possibly in a wartime economy when production at all costs is the theme such output can be justified. In an efficient and normal economy it is difficult to justify such a position. Accompanying longer work weeks were increases in absenteeism and injuries.

The 6-hour workday unbroken by a lunch hour but with a slight interval for refreshments is not an industrial impossibility. A study reported by the U.S. Department of Labor (*26*) describes the experiences of a factory which changed from three 8-hour shifts to four 6-hour shifts. This led to a reduction in earnings for most employees. Four hundred and twenty women were interviewed. Of this number, 265 had worked under both systems and 77 percent of this group preferred the 6-hour shift because it gave them "more time for the home," "more leisure," and "less fatigue."

During the war, when many people were concerned with the optimal work week from the point of view of maximum production, the Industrial Relations Section of Princeton University canvassed a group of key industrial relations executives in representative companies throughout the country. The prevailing judgment of these executives (22) was that the 8-hour day and 48-hour week constituted the best schedule for sustained production in our war industries. This study gathered striking evidence which indicated that a work week of more than 48 hours, and particularly over 54, resulted in a reduction in individual output and an increase in the number of days missed from work. The effects of the long hours piled up slowly and did not become evident in the first few weeks under the extended schedules. The survey also found that an increase in the number of days worked per week from 5 to 6 seemed to have less effect on productivity than an increase in hours per day.

The increase in absences with the 8-hour day and 6-day week is probably due more to a desire for leisure or recreation than to the accumulation of physical fatigue. Women in particular want time off on a weekday for shopping and household duties; they probably achieve their best performance in a 5½-day week, even if it entails longer daily hours.

Some years ago, when the employees of a large department store in New York City returned to work after a strike, they voted 822 to 97 for shorter hours with the same pay. The settlement plan they voted for called for a 5-day 40-hour week; they turned down a 5½-day 42-hour week with a weekly wage rise of $1.50. In other words, employees who do not earn too much money in the first place prefer a 5-day week to a 5½-day week.

The question of nominal hours in relation to actual hours of work should not be an emotional issue but rather a subject calling for careful study of the available facts. Most of the published material in the field indicates that shortening the work week does not necessarily interfere with total production; in fact it may serve to increase total production.

Furthermore, this material indicates that overtime results in inefficiency. With the general practice of paying for overtime at 1½ times to twice the normal rate, the cost of production must mount even higher when it is recognized that production during the overtime period is less than it is during the normal workday. Moreover, overtime has been found to lower production both the day the overtime occurs and the following day. A worker consciously or unconsciously paces himself when he knows he must put in extra hours that day. Telling employees, without warning,

that they are expected to work overtime creates dissatisfaction. On the other hand, if the announcement is made a day in advance, there is usually an increase in absenteeism. No matter how one looks at it, overtime means an increase in the hourly working week and often serves little purpose, although the employee may not object to it because it affords him an opportunity to earn more money. In a study conducted over a three-year period (*24*), Scheidt reported that a 6-hour day raised employee efficiency from 15 to 30 percent above what it was for an 8-hour day that included two hours of overtime. The employees were 17 women who set type by machine and 52 men who set it by hand. Overtime is not recommended as a means of increasing production, unless it is infrequent and on a volunteer basis.

### The Ultimate Work Week

In view of the current trend in the work week, it appears safe to say that we are on the brink of the 30-hour week. This work week, with our present means of production, is entirely within the realm of possibility. It is to be hoped that the decision to adopt it will not involve the emotional battles characteristic of all previous reductions of the work week, but rather that management and labor will approach the question from a factual basis and decide it solely on whether it will result in decreased production and increased costs, or whether production can be kept up and costs maintained or lowered. Many people may be surprised to learn that in manufacturing as well as retail organizations such a work week can yield maximum production and satisfaction.

There are some who are ostensibly worried about the shorter work week for fear the employee will not know what to do with his spare time. If the company and the community are really concerned with this problem and attack it intelligently, it provides no cause for worry. Other people insist that an honest day's work stretches from sunrise to sunset and that everyone should work an "honest day." In certain respects, this book is dedicated to the joys of working, but it also acknowledges that too much of anything can give cause for worry. The marvels of our productive ability have contributed toward the shorter workday and thus enabled us to transfer our interest to other things. An "honest day's" work is desirable, but there is no reason to believe that an 8-hour day—which was once 12 hours, then 10—represents the acme of honesty. If a college professor had to teach 8 hours a day, he would have no time to write books (maybe that would be a good thing!).

### Unproductive Working Time

In a survey and analysis of the working day (*1*) Angles found that over 30 percent of the working day was unproductive. Collecting materials, delivering finished goods, sharpening and preparing tools, and consultations absorbed this 30 percent.

The present author's observations of professional workers indicate that

*"Ever notice how little time those people actually spend working?"*
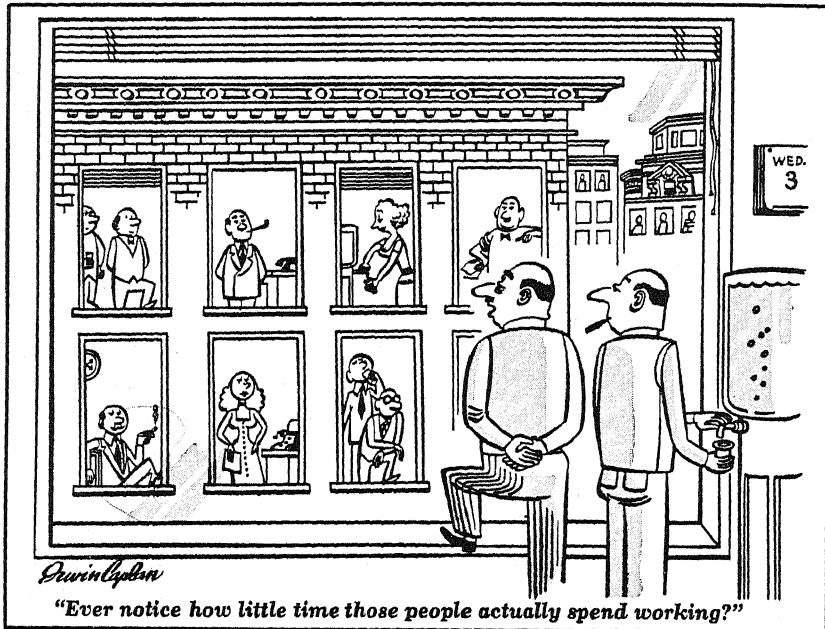
*Figure 14.5.* (From *The American Legion Magazine.* By permission of the magazine and the cartoonist, Irwin Caplan.)

unproductive working time is much greater, amounting possibly to 50 percent of the working day. Professional workers—be they researchers, writers, or statisticians—present weird problems to a director of research. The badge of distinction of this group seems to be the privilege of arriving between 10 and 20 minutes late. Coffee and newspaper time is a necessary allowance several times each day. Informal consultations with fellow workers take their toll. Taking a leaf out of the executive's book, the professional worker finds that the one-hour lunch period is totally inadequate; he usually manages to get around this by going to lunch at a different time every day, hoping thus to prevent a check from being made on his habits. In some cases, it is almost three o'clock before the day's work is be-

gun. Many professional people avoid a sense of guilt by bringing a brief case in which they take work home, but the work is rarely done until the deadline for the finished job is upon them.

This is not a tirade against professional workers; it is merely an illustration of the inroads that unproductive working time can make. The employer, factory worker, clerk, and professional worker must acknowledge that a considerable part of the day is spent in unproductive activity. It is because of this that the nominal work week can justifiably be reduced without in any way affecting production.

Many attempts have been made to increase production by cutting down the unproductive time, but this will not be discussed here because it is not directly related to work fatigue or monotony.

### Rest Pauses

In Chapter 2 it was shown that rest pauses are valuable aids to increasing production. However, the length of the rest pause and what the employee shall do during it deserve consideration.

From the point of view of management, it is best to give the employee a regular rest pause, for if management does not do so, the employee will take it anyhow. Some employees spend more effort and energy in "soldiering" on the job than in doing the work they are supposed to do. A typist may not leave her desk or take her fingers away from her machine, but she may be indulging in a rest pause; she may be typing personal letters or other material not connected with her job. The professional worker who is suddenly attacked by drowsiness during the afternoon learns to rest his head on his hand with his index finger propping one eye open as if he were in the process of "creating." The man who works at a machine often finds it necessary to adjust the machine—it suddenly "doesn't seem to be working just right." In other words, during a normal working day, employees will take a rest pause. When management offers such a rest or forces them to take one, much is gained in the form of good will and a reduction of guilt feelings, plus the alleviation of fatigue or monotony if it exists.

Depending upon the type of work, the number and duration of rest periods vary. For most jobs a 10- to 15-minute rest in midmorning and midafternoon seems to bring the best results. To determine definitely whether one or two rest periods are necessary, data should be gathered on production and the employees should be interviewed. Such brief experimentation will often lead to the correct answer.

It is important that the employee change his posture during the rest pause. If he sits while working, he should be encouraged to stand or walk around. If he stands, he should be encouraged to sit down or, if possible, to lie down. The important thing in a rest pause is that the activity and posture of the body be different from the activity and posture required on the job. For example, basketball as it is played today is strenuous and active. Watching the leading college teams play provides a vivid illustration of the principle that the activity should change during the rest pause. However, various teams do different things during the rest period. Some just sit; others stand, and still others lie down. Some teams seem to be so disorganized that the men can do anything they want to during the period. But regardless of posture or activity, all the teams seem to recover equally.

In some industrial organizations refreshments are served during the rest pause. The value of the coffee, soda, or ice cream that is provided lies in creating a favorable employee attitude toward the rest and in filling the time, rather than in supplying nourishment for the energy needed to continue work.

## Absenteeism

The incidence of absenteeism should not be overlooked in considering the relationship between production and nominal hours of work per week. An increase in the work week often results in an increase in absenteeism, which ultimately means a reduction in the hours worked. Any serious investigation of the causes of absenteeism reveals that there are numerous reasons for it. Also, an employee often has more than one reason for being absent. Schenet (25) conducted a careful survey of absenteeism in a certain factory. The study, which was based upon an analysis of the records of 280 men and 470 women over a four-month period, showed that absenteeism was three times greater among women than among men. For sickness absences the rate for women was twice that for the men, and for personal absences the rate was three or four times greater for women than for men. There was no great difference in absentee rates on the basis of age groups, except for a very slight tendency for older employees to be absent more frequently. Schenet found vast differences in absenteeism from one department to another; in the final assembly department the absentee rate for both sickness and total absences was the highest of all. He regards this as extremely puzzling and says that no data were uncovered that shed any light upon it.

However, the work referred to earlier when the concept of morale was considered may present some light. Differences in supervision and/or differences in morale could have existed in the departments. Either could contribute to the differences in the absentee rates even though the final assembly department is assumed to have more interesting work (which it may not). The more recent work of Covner (*5*) and Mann and Baumgartel (*19*) shows that absenteeism rises as supervising quality decreases.

In a study based upon a sample of 550 employees, Jackson (*15*) found that the causes of excessive absenteeism were as follows:

| | |
|---|---|
| 1. Poor work habits | 6 percent |
| 2. Personal adjustments | 9 percent |
| 3. Dissatisfaction with work | 16 percent |
| 4. Irresponsibility | 17 percent |
| 5. Outside difficulties | 17 percent |
| 6. Sickness or fatigue | 35 percent |

His work, together with other material in the literature, indicates that although sickness is the greatest single cause of absenteeism, it is only a minor cause when the total picture is considered.

Individual adjustment, emotional difficulties not related to the job, and other individual problems contribute to making absenteeism a psychological problem. It is advisable to ask an employee with a high absentee rate to come in for an interview in which the basic reasons for his absenteeism can be discussed. Often, during such an interview, the groundwork can be laid for a better understanding with him and attempts can be made to correct the irrelevant conditions which may be responsible for the absenteeism.

It is interesting to note that absenteeism is highest at the beginning and end of the week and lowest on payday regardless of what day in the week it falls on. The distance traveled to and from work and household responsibilities, especially on the part of women employees, are also factors which contribute to excessive absenteeism.

The point to be remembered about absenteeism is that employees must have time to take care of their personal needs; if the hours of work prevent this, then absentee rates will be high. When an employee takes time off on his own, he often feels that since he is paying for it he does not have to inform management in advance. If management were to grant an employee a half-day off for shopping, it might result in an increase in production, rather than a decrease, if for no other reason than that management would have someone else take his place on the production line.

Covner (*5*) presents a delightfully refreshing and different view on absenteeism. He states, "At the time of inaugurating the study management voiced the hope that the study would provide a 'convenient means for getting rid of worst offenders, and preventing the hiring of potential offenders.' Somewhat to management's surprise, the findings pointed to management factors as main causes of absenteeism."

The major finding in this study is that two factors appear to be most closely associated with absenteeism—size of department and quality of supervision. Covner considers absenteeism as management centered or worker centered and feels that these two centers should not be thought unrelated. He also cogently sees the relativity of absenteeism to loose or tight labor market conditions, and inferentially suggests that, depending on such conditions, symptoms other than absenteeism—e.g., grievances or uncoöperativeness—may arise.

Mann and Baumgartel report a study typical of the University of Michigan group (*19*). They compared the attitudes of high and low absentee rate employees. The subjects were 163 office employees and 251 "blue-collar" men working for the Detroit Edison Company. The investigators found that a more favorable attitude toward supervisor and a more favorable feeling about work associates accompanied lower absentee rates for both blue- and white-collar workers.

The foregoing makes it clear that the incidence of absenteeism solely because of excessive fatigue is low.

## Summary

The elimination or reduction of fatigue is desired by employers and employees. Fatigue has been studied in the laboratory and in industry but still has not been adequately defined. Neither tests that measure changes in physiological conditions due to work nor performance tests have as yet been established as valid measures of fatigue.

Such related phenomena as mental fatigue, monotony, and boredom are often confused with fatigue. It is likely that mental fatigue does not exist as an entity apart from physical fatigue and that the tension accompanying some tasks produces fatigue to a greater extent than the task itself. Monotony is not inherent in a job; it is a result of the worker's attitudes and abilities in relation to the job.

Fatigue can be reduced in industry by the introduction of rest pauses. Their duration and number should be determined on the basis of the type of work performed. Monotony can be reduced by selecting employees

more carefully, by making work more meaningful, and by providing recreational activities.

The crux of the problem in industry is the relation between hours of work and total production. Shortening the work week does not necessarily result in a decrease in production. Much evidence indicates that production is maintained, or even increased, when the work week is decreased. This is true because the nominal hours of work are not the same as the actual hours worked; reduction in working time may decrease the nominal hours but not the actual hours.

The work week has been steadily decreased and there is no reason to believe that the 40-hour week is the ultimate optimal week.

Absenteeism in industry occurs for many reasons. Sickness is the greatest single cause but not the major reason. Personal needs and other individual problems contribute heavily to absenteeism. Allowing the employee time off often reduces absenteeism and increases the number of hours actually worked. Recent research indicates that absenteeism is related to quality of supervision.

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# CHAPTER 15

# Time and Motion Studies and Human Engineering

**TIME** and motion studies have as their objective the elimination of waste and inefficiency. This is achieved through the reduction of costs, the improvement of work methods, and the minimizing of work fatigue. Establishment of a basis for effective training and the determination of wage rates are also results of these studies. In time studies, the emphasis is on determining the standard time required to complete a task. In motion studies, the methods, motions, and movements of the worker are analyzed. Whereas these two studies were once treated separately, they now are often combined, for they are intimately related; rarely is there justification for performing one without the other.

The stock in trade of the "scientific manager" or the "efficiency expert" is usually a variation on the theme of time and motion studies. This subject has for some years been a controversial one, with management glorifying it and labor condemning it. Both sides have been right and wrong at the same time. The main difficulty has resulted from the misapplication of time and motion studies. If, as a result of these studies, more efficient production were achieved through a rearrangement of tools, fatigue were decreased, and costs were reduced, with, at the same time, a fair increase in the earning capacity of the employees, there could be no valid objection. To object to time and motion studies on the ground that they result in more efficient work is not only illogical but often emotional. Nevertheless, the objection has been heard that, too often, they are not concerned with a general increase in efficiency but are used as an excuse for a speed-up or for the dismissal of employees. This objection is valid, but it is not so much a criticism of the studies as of their misapplication. It is important to emphasize that time and motion studies need not be unfair. They

can be useful in promoting the aims of both management and labor, provided they are carried out correctly and are not misapplied. Furthermore, when they lead to increased efficiency, they must result in some gains to the worker as well as to management.

### Potential Failure of Time and Motion Studies

Despite the objectives of a time and motion study, and the "scientific" attempts to measure the time and motions involved in the performance of a task, the average study in industry is doomed to failure and is likely to be scrapped. This is a radical statement, but it is made in spite of the facts uncovered and the claims made; it also contradicts much of the literature in the field which has appeared since Frederick W. Taylor's work in the 1890's. Time and motion studies in and of themselves are not nearly the formidable bulwarks of efficiency that they appear to be on cursory examination.

The psychological components of time and motion studies are very important. Whenever these are overlooked—and they often are—these studies become ineffective tools in the hands of fools. Under these circumstances they do not produce greater efficiency; they merely produce greater dissatisfaction. The idea here is not that such studies are morally wrong, but that unless the problems that result from them are recognized, the studies can never really have a chance to accomplish anything of value.

The story of Johnny will illustrate the point. Johnny was the informal leader of a group of employees in a certain department of one of the Western Electric plants. He and his group were on a piece-rate basis and were earning more than the average hourly rate for similar departments. This resulted in a series of visits from a man who made time and motion studies. Before going into the reasons why his studies failed in this instance, some background material is necessary. A description of Johnny and his co-workers is desirable for an understanding of the total situation.

In many respects they were just like any other group of factory workers, and in some respects "even more so." A college professor might consider them a rough and tough bunch. But they really were not. They were young, aggressive, and totally uninterested in education. They had two hobbies. All of them were amateur prize fighters, and they liked to train "on the job." Whenever the foreman was away they were likely to do a little sparring. Their enthusiasm was real, and every now and then someone would be "knocked out." Naturally the presence of a body in a prone

position caused some dismay, but the problem was usually solved by rolling the fellow under a worktable. None of them ever really got angry over this because the next bout might result in a reversal of the decision.

Their second hobby was trying to put something over on the special policeman stationed at the entrance of the factory. They regarded him as a person who distrusted them and they accepted this challenge by seeing how successfully they could slip pieces of equipment past him. At first it was only parts, but later it was telephones. That they had no earthly use for the equipment was proved by their practice of bringing it back into the factory undetected.

Their work methods were also highly individualistic and aggressive. The telephones which they were to disassemble arrived on rather large hand trucks. Whenever such a truck left the elevator someone in the group would give a blood-curdling yell, "Breaks." This was the signal for all of them to stop work immediately and rush to the truck. In their language a "break" was a telephone partly disassembled at the time it reached them, which meant less work for them to do. All of them pushed and fought for these "breaks," cramming them under one arm and grabbing for the others with their free hand. The one who collected the greatest number of the telephones was the winner and he strutted accordingly.

As indicated, this group consisted of a number of highly aggressive individuals who delighted in physical violence and rather violent horseplay. With this knowledge of the group, we can return to the man who made the time and motion studies.

In this company, this man's identity was immediately recognizable. He wore a white starched shirt without a coat and carried a board with a clock inserted at the top. He would stand behind the worker with one foot on a stool and observe the employee on the job.

In the case of Johnny's group the time and motion study man made a series of trips. Before long he observed only Johnny, who incidentally was the best worker. Johnny, however, always slowed up when he appeared. When the man accused him of this, Johnny always answered, "If you can do the job better, why don't you do it?" Since the time and motion study man could not do the job, he had to be content with merely observing and making notes. After a period of time, the rates were changed. Johnny's group objected to this, but at the same time saw to it that the change did not affect their total earnings. Their goal was to earn about $10 a week more than the prevailing hourly rate, and they did. At first they did not fool around so much, but the more stringent control of

rates led them to change their entire work method. (This was unknown to the company or at least to the time and motion study man.) Within three months they became a highly coöperative group. When the telephones arrived on the floor, there was no rushing to the truck. One man rolled the truck to his station and began to remove the base of the phone. Then he passed the phone to the man who did the next step in disassembling, and then it went to the third and fourth men until, in their language, it was stripped. The fifth man served as a substitute and was also responsible for watching for an unexpected visit from a supervisor or a time and motion study man.

This story illustrates how these workers, by their own efforts, overcame the wage rate set by the time and motion study man. They had to increase their production but they maintained their earnings. Dissatisfaction also increased in the group, as evidenced by their vocal disapproval of the company and its policy.

Another illustration along the same line is a story told by Mr. Ruttenberg, formerly of the CIO. After stating that when standards are set exclusively by management without the men's participation, the company does not obtain anywhere near top production, the president of one of the largest companies in Pittsburgh challenged him to prove his point. In accepting this challenge, Ruttenberg requested the company engineer to tell him which job he thought most ideal for the test, i.e., the job with the greatest production. He thereupon offered to double this production in a month. Ruttenberg talked with the men on the job and assured them that a production rise would not affect their rates. In a month they had achieved 210 percent production.

Most time and motion studies, however, do not constitute a challenge to employees, as in these two instances; rather they result in what might be interpreted as a concerted effort on the part of the employees to prove that the new method is no good or that the new gadget is a waste of time. And they resist the change. The resistance is psychological in nature, but it must be reckoned with if time and motion studies are to lead to greater efficiency without a decrease in employee satisfaction.

### Resistance to Time and Motion Studies

There are three major forms of resistance to time and motion studies: (1) objection to change, (2) the fact that the change is initiated by an outsider, and (3) the worker's increased feeling of insecurity. People are not capable of adjusting to rapid change. This applies to changes in doing a job as well as to changes in social codes.

We must recognize the serious implications of this resistance to change and newness. Time and motion studies often point to the fact that something new is needed in the job. The new thing may lead to improvement, but when it is introduced no improvement will be apparent because the worker will resist it, not because it is a better way of doing the job but because it is a "new" way.

The second objection to a time and motion study is the fact that an outsider initiates the change. Practically every worker does his job in a certain way and has his reasons for doing it that way. He resents being told by someone that he is not doing it efficiently. He may suspect that the outsider is there to "show him up" and he naturally will do all that is humanly possible to prevent it. The best way to defeat the purpose of a change is to have an "outsider" propose the change. Whether it is a worker on his job or a community that has the problem, the importation of experts or "outsiders" either retards or halts progress in the direction of the desired change. Thus Johnny's group decided at all costs to show up the time and motion study man, regardless of the change in their rate.

The "efficiency expert" who comes into an office and sets up a new filing system or installs a centralized stenographic pool may have the right idea, but the workers will not believe it and they will manage to adopt as little of the change as is possible. Furthermore, when supervision is relaxed, they are likely to go back to their old method, not only because they dislike the new ways but because they still resent the intrusion of an outsider.

The third resistance to time and motion study, increased feelings of insecurity, is in part psychological and in part economic. Too often in the history of time and motion studies the results have been used to speed up production and lower wage rates. Even though a specific employee may not have been involved, he has heard about such cases and regards these results as an end product of time and motion study. Insecurity increases, and he often fears that he will be dismissed from his job. Hence he does all he can to avoid having his pay lowered or being fired. His usual defense is an attempt to show that the new method will not work.

## Men in Motion

The father of "scientific" management was Frederick Winslow Taylor, a mechanical engineer. According to him (*24*) "scientific" management (the quotes are mine) is based upon the firm conviction that the interests of the employer and the employee are the same, and that this system

makes it possible to give the workman what he wants most—high wages—and the employer what he wants—a low labor cost. Taylor proposed scientific management as opposed to "management of initiative and incentive." He believed that his system was scientific because it gathered to-

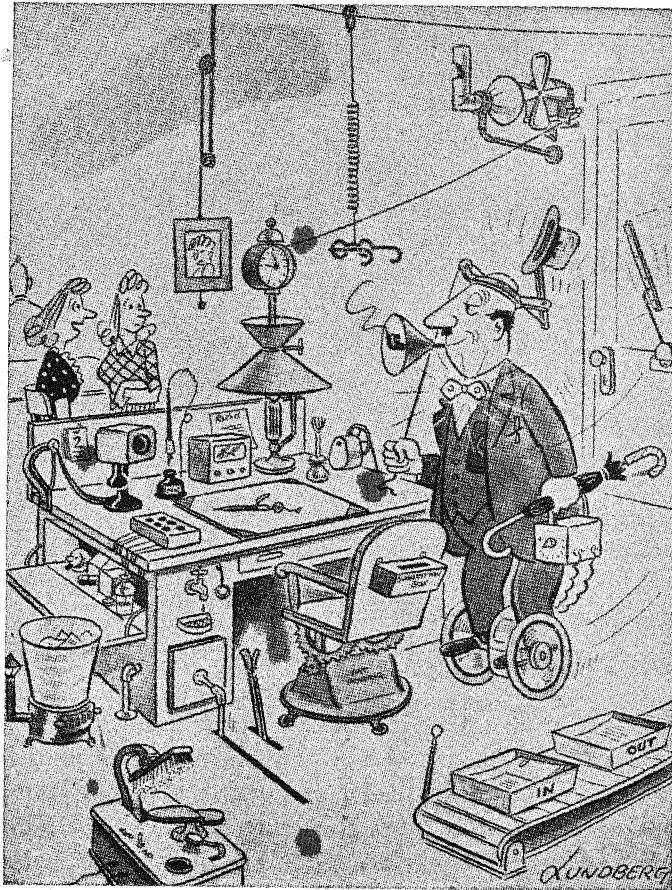



*Figure 15.1.* "He almost saved a minute this morning." (From *Pic,* December, 1948. By permission of Street & Smith Publications, Inc., and the cartoonist, Gustav Lundberg.)

gether the knowledge formerly possessed only by workmen and classified, tabulated, and reduced it to laws, rules, and formulas. He proposed that management take on new duties, such as (1) developing a science for each element of a man's work, (2) scientifically selecting and training workmen, (3) coöperating heartily with the men, and (4) taking over all

duties and work for which it is better fitted than the workmen. Taylor states in summary, "Under the management of initiative and incentive practically the whole problem is up to the workmen, while under scientific management fully one-half the problem is under management." To be perfectly blunt, either Taylor must have been a supersalesman or industry in 1890 was very primitive and its executives were very naïve. Analyzing Taylor's system and the manner in which it was put to use allows no justification for the term "scientific."

The Taylor study which has achieved historical importance is the "Pig-Iron Handler," a study of a gang of men loading pigs weighing 92 pounds and loading an average of 12½ tons per day. Taylor's lack of concern and sympathy with workmen is revealed in his statement, "This work is so crude and elementary in its nature that the writer firmly believes that it would be possible to train an intelligent gorilla, so as to become a more efficient pig-iron handler than any man can be." His lack of sympathy and respect is further reflected in the way he reports his handling of a worker named Schmidt (*24*, pp. 44 ff.):

"Schmidt, are you a high-priced man?"

"Vell, I don't know vat you mean."

"Oh yes, you do. What I want to know is whether you are a high-priced man or not."

"Vell, I don't know vat you mean."

"Oh, come now, you answer my questions. What I want to find out is whether you are a high-priced man or one of these cheap fellows here. What I want to find out is whether you want to earn $1.85 a day or whether you are satisfied with $1.15, just the same as all those cheap fellows are getting."

"Did I vant $1.85 a day? Vas dot a high-priced man? Vell, yes, I vas a high-priced man."

"Oh, you're aggravating me. Of course you want $1.85 a day—every one wants it! You know perfectly well that has very little to do with your being a high-priced man. For goodness' sake, answer my questions, and don't waste any more of my time. Now come over here. You see that pile of pig iron?"

"Yes."

"You see that car?"

"Yes."

"Well, if you are a high-priced man, you will load that pig iron on that car tomorrow for $1.85. Now, do wake up and answer my question. Tell me whether you are a high-priced man or not."

"Vell—did I got $1.85 for loading dot pig iron on dot car tomorrow?"

"Yes, of course you do, and you get $1.85 for loading a pile like that every day right through the year. That is what a high-priced man does, and you know it just as well as I do."

"Vell, dot's all right. I could load dot pig iron on the car tomorrow for $1.85, and I get it every day, don't I?"

"Certainly you do—certainly you do."

"Vell den, I vas a high-priced man."

"Now, hold on, hold on. You know just as well as I do that a high-priced man has to do exactly as he's told from morning till night. You have seen this man here before, haven't you?"

"No, I never saw him."

"Well, if you are a high-priced man, you will do exactly as this man tells you tomorrow, from morning till night. When he tells you to pick up a pig and walk, you pick it up and you walk, and when he tells you to sit down and rest, you sit down. You do that right straight through the day. And what's more, no back talk. Now a high-priced man does just what he's told to do, and no back talk. Do you understand that? When this man tells you to walk, you walk; when he tells you to sit down, you sit down, and you don't talk back at him. Now you come on to work here tomorrow morning and I'll know before night whether you are really a high-priced man or not."

By introducing rest periods and closely supervising the job, Taylor increased Schmidt's production (provided it was average) from 12½ to 47½ tons per day, an increase of 280 percent. Schmidt's salary was increased from $1.15 per day to $1.85, per day, or 61 percent. The present writer makes no claim that Schmidt should have received a 280 percent salary increase, but it is apparent that the salary increase was disproportionate to the increase in production. It is entirely possible that a problem which still confronts America's mass-production industry originated with the Schmidt episode.

Another aspect of Taylor's work involves scientific selection of workmen. He glibly stated that only one man in eight can produce 47½ tons per day. This meant job changes for seven out of every eight men on a gang. There is a great likelihood that his norm for production was too high, and that his selection was not scientific.

To understand Taylor, it is necessary to refer to his early work at Midvale Steel (*24*, pp. 49–50).

As soon as the writer was made gang-boss, one after another of the men came to him and talked somewhat as follows:

"Now, Fred, we're very glad to see that you've been made gang-boss. You know the game all right, and we're sure that you're not likely to be a piece-work hog. You come along with us, and everything will be all right, but if you try breaking any of these rates you can be mighty sure that we'll throw you over the fence."

The writer told them plainly that he was now working on the side of the management and that he proposed to do whatever he could to get a fair day's work out of the lathes. This immediately started a war; in most cases a friendly

war, because the men who were under him were his personal friends, but none the less a war, which as time went on grew more and more bitter. The writer used every expedient to make them do a fair day's work, such as discharging or lowering the wages of the more stubborn men who refused to make any improvement, and such as lowering the piece-work price, hiring green men, and personally teaching them how to do the work, with the promise from them that when they had learned how, they would then do a fair day's work. While the men constantly brought such pressure to bear (both inside and outside the works) upon all those who started to increase their output that they were finally compelled to do about as the rest did, or else quit. No one who has not had this experience can have an idea of the bitterness which is gradually developed in such a struggle. In a war of this kind the workmen have one expedient which is usually effective. They use their ingenuity to contrive various ways in which the machines which they are running are broken or damaged—apparently by accident, or in the regular course of work—and this they always lay at the door of the foreman, who has forced them to drive the machine so hard that it is overstrained and is being ruined. And there are few foremen indeed who are able to stand up against the combined pressure of all of the men in the shop. In this case the problem was complicated by the fact that the shop ran both day and night.

The writer had two advantages, however, which are not possessed by the ordinary foreman, and these came, curiously enough, from the fact that he was not the son of a working man.

Referring to the third item in Taylor's system, coöperation with the men, coöperation for him cannot be interpreted in the sense that coöperation was used in the chapter on morale. Taylor attributed his success as a gang boss to two facts: (1) that he was not the son of a workingman and management would therefore believe him sooner than an ordinary worker, and (2) that he was different and lived apart from the other workmen. From this point of view he cannot possibly be talking about true coöperation.

Taylor also believed that increases of more than 60 percent in the uniform wages usually paid would make the men shiftless, extravagant, and dissipated. He reported this after referring to a long series of experiments and observations but he did not mention the type of experiment; it does not appear that his observations were unbiased. Since his time, wages have gone up considerably more than 60 percent and workmen have not become shiftless, extravagant, and dissipated. Taylor represents those who believe that the average workman is dull and has no interests except earning more money, but that he is so stupid that earning too much is bad for him; therefore management is protecting him by keeping his salary increases small.

A world of difference exists between Taylor's views and the present-day

views of many industrial psychologists and industrial engineers. Some of these differences can be attributed to the work which has been done by Frank B. Gilbreth, an engineer, and his wife, Lillian, who was trained in psychology. Since his death some years ago, Lillian Gilbreth has carried on their work and is still active.

. The first work done by Frank Gilbreth in this field was in connection with bricklaying (5). His first study involved much more than the introduction of rest periods and constant supervision of the worker on the job. It was a minute study of the motions involved in bricklaying and it enabled him to reduce the motions from 18 to 5, thereby increasing production from 120 to 350 bricks per man-hour.

The two Gilbreths worked together very closely and the results of their work demonstrate the advantages in having an engineer and a psychologist work in coöperation. From their training, the engineer and the psychologist acquire a great deal of complementary information. Alone they can make serious mistakes. Together they can make real progress. They can act as a check on each other so that the human element does not cause neglect of the mechanical, and vice versa. It is indeed too bad that such teams are not more frequent.

The Gilbreths devise a system of efficiency that included nine principles, namely, (1) individualization, (2) functionalization, (3) measurement, (4) analysis and synthesis, (5) standardization, (6) records and programs, (7) teaching, (8) incentives, (9) welfare.

Their system was all-inclusive and in many respects valid, not only in the production increases obtained, but in the recognition that the individual workman was the unit to be measured. The Gilbreths believed that the details of the work situation should be adjusted to the individual rather than the individual being forced into the pattern of the job. Their writings (*6*, *7*) show much more insight and understanding of the individual than Taylor's work, and there is little evidence of the contempt for the workman which Taylor seems to have had.

One of the most interesting of the Gilbreths' contributions was the analysis and breakdown of a task into its basic elements of motion, which they called "therbligs." This word, invented by Frank Gilbreth as the result of a suggestion from his wife, can in some respects be considered as a forerunner of Serutan. Reading therblig backward gives the name Gilbreth except that the *t* and *h* are reversed. The therbligs are very useful; each has a name and a symbol, as shown in Figure 15.2.

Every job involves a number of these therbligs. By way of illustration,

consider signing one's name. A man usually keeps his fountain pen in his inside coat pocket. In therblig terms he must search, find, select (assuming he has more than one pen), transport loaded, position, disassemble,

| SYMBOL | NAME OF SYMBOL |
|---|---|
| | Search |
| | Find |
| → | Select |
| ∩ | Grasp |
| | Transport Loaded |
| 9 | Position |
| # | Assemble |
| U | Use |

| SYMBOL | NAME OF SYMBOL |
|---|---|
| # | Disassemble |
| 0 | Inspect |
| | Pre-position |
| | Release Load |
| | Transport Empty |
| | Rest for Overcoming Fatigue |
| | Unavoidable Delay |
| | Avoidable Delay |
| | Plan |

*Figure 15.2.* Gilbreth's Therbligs. (From L. P. Alford, ed., *Management's Handbook,* New York, The Ronald Press Company, 1924.)

position, use, assemble, transfer, search, find, and position. A lot of work for such a simple task that is done in so short a time.

After all the therbligs involved in the task have been identified, it is then necessary to ask six questions:

1. Is each therblig necessary?
2. Can the task be made simpler by having fewer motions?
3. Can there be less motion in performance or degree?
4. Can the steps be combined?
5. Can the sequence be changed?
6. Can more than one be done at the same time?

To go back to signing one's name, it is immediately obvious that a more efficient system would use a desk-set pen in a fixed position; this requires no assembling and disassembling and no selecting, and many of the other therbligs are not required.

Another simple illustration is the number of steps involved in inserting letters in envelopes and addressing and stamping them. A good exercise at this point would be to plan an efficient system. Remember that the intro-

duction of equipment and machinery is not always desirable. An automatic stamping machine and addressograph might cost too much in relation to the average amount of mailing that is done by the typical small organization.

A good perspective on what has happened in the field of time and motion study since the early 1900's will be gained from F. W. Schumard's *A Primer of Time Study* (*21*). He writes, "It is believed that the make-up of a good time-study man is comprised of a percentage of 80%—20%. The 80% can be called contact, the other 20% can be called education and common sense." He then lists 24 inherent and acquired qualities of such men. Although Schumard is serious, he shows the nonsense that an industrial engineer can indulge in when he tries to play the role of a psychologist. So, by way of illustrating what *not* to do, his list is presented in Table 15.1.

Table 15.1. Twenty-Four Inherent and Acquired Qualities of Time Study Men

| | |
|---|---|
| 1. Honesty | 13. Self-confidence |
| 2. Personality | 14. Cooperation |
| 3. Imagination | 15. Sense of responsibility |
| 4. Sense of fairness | 16. Observation |
| 5. Open-mindedness | 17. Analysis |
| 6. Power of sympathy | 18. Judgment |
| 7. Tact | 19. Accuracy |
| 8. Resourcefulness | 20. Planning ability |
| 9. Reliability | 21. Power of instruction |
| 10. Self-control | 22. Optimism |
| 11. Energy | 23. Salesmanship |
| 12. Proper conduct | 24. Leadership |



This list is open to criticism because these 24 traits do not define a time study man any more than they define a doctor, a lawyer, an Indian chief —or even a psychologist. Probably any self-respecting person in any self-respecting job believes that these 24 traits are necessary in his specific job, too, and they probably are. Open-mindedness, power of sympathy, personality, courage, etc., are all desirable traits. But it is safe to assume that Schumard did not reach his conclusions as the result of tests and measures. The remainder of his book is a sound exposition of the slide rule, stop watch, wage scale, rest factor, and other items. Although it does give tips on how to make a time study, application of the method would

run into the same difficulties that doom time and motion studies to failure. It does not take into consideration the most important item, the resistance factor, which is invariably encountered.

Mogensen (*18*) has a much more practical and valuable approach—the education of foremen and employees along lines that will encourage their becoming "motion-minded." He does not believe that the average worker is dull-witted but he admits that he sometimes lacks enthusiasm. Mogensen encourages motion-mindedness in a plant by showing "before and after" motion pictures of work done with time and motion studies in other plants. He then trains the foreman and executives in some of the specifics of time and motion study; it is the executives' job to convince the workers that they will not be subjected to speed-ups or dismissal. In this manner the resentment that a time and motion study engineer usually encounters is avoided. It is to be emphasized that Mogensen's approach tends to overcome the three serious difficulties in time and motion studies. It avoids both the resistance to an outsider's initiating change and the insecurity-producing factors of time and motion studies, and it encourages an acceptance of change, since the workers themselves participate in and contribute to the change. The foreman and employees become involved in many of the intricacies of time and motion study. They construct process charts and make suggestions as to how to achieve greater efficiency.

As a consultant in this field, Mogensen has had considerable success with his method. It is exceedingly interesting to find William Gomberg of the International Ladies Garment Workers Union writing of the "evangelical activities of Allen Mogensen on behalf of the work-simplification movement."

It is a mistake to believe that time and motion study can be a tool of efficiency only for management. Labor through its unions can, and in rare cases does, conduct time studies which result in benefits to its members. An outstanding illustration of this is the work that has been done by the ILGWU under Gomberg's direction. The management engineering department of the ILGWU was created to pursue two objectives (*8*):

1. To assist in improving the manufacturing techniques and operating methods of all branches of the industry with which our workers' earnings are intimately bound. This will be done through plant inspections by department representatives, followed by specific recommendations.
2. To serve as a central information agency:
   (a) To determine the level of "fair piece rates."
   (b) To record the production system and manufacturing techniques under which these rates are paid.

(c) To assist in training shop members and committees in distinguishing bad time-study practices from good time-study practices in the determination of rates.

The union's primary concern, as reflected in its practices and behavior, is to use time studies for obtaining data so that it may bargain collectively with employers in establishing salary standards and piece rates. Its attitude toward these studies is generally thoughtful and critical. Gomberg regards them at the present time as, at best, an empirical guide to setting up a range within which collective bargaining on production rates can take place. He is very critical of the stop watch as a measuring device when one is striving for a reasonable range in accuracy of measurement, and he has data to prove the lack of reliability of such measurements. He questions that there is a single standardized method of performing a job and considers modification of method from worker to worker both desirable and efficient. Gomberg also recognizes a third limitation of time studies (9). "It is at once apparent that nothing has been developed in industrial time study practice that can be considered an objective measure of normality or an objective method for comparing operator performance with any normal standard."

The work of the ILGWU management engineering department is primarily concerned with time rather than motion study. The department is interested mostly in the setting of piece rates and considers most motion studies to be primarily the concern of management. However, on invitation from management, it does attempt to increase production in specific plants, and in these cases it is concerned not only with the setting of a fair piece rate but also with motion study.

Gomberg does not deny the usefulness of time studies, provided their limitations in accuracy, both as a measuring device and as a means of setting standards, are recognized. He believes that no alternative method of measuring or estimating a reasonable day's work has as yet appeared and that therefore time study methods and procedures must be called upon until a better technique is found.

One additional feature of this union's approach is the training of its members on the various shop committees in time study techniques. Sometimes these trained employees are accused by their fellow union members of not representing the workers' best interests, and yet they are backed by the union. This means that the technique, when applied fairly, allows for a reasonable settlement of claims rather than resulting in a one-sided

and emotional view. Mogensen and this union both have faith in the training of workers in time and motion study techniques. Regardless of one's opinion as to whether management alone or management in col-

*Figure 15.3.* Worker's Suggestion Saves Production Time. (Courtesy of General Electric Company.)

laboration with labor should set wage standards, there is no doubt but that employees can contribute to their own efficiency at least as much as the expert can, and in some cases more. They need only training, an opportunity for expression, and confidence that their improvements will be adopted. Figure 15.3 shows one of the many ways in which manage-

ment can recognize employee suggestions on how to increase production.

### Some Simple Principles

Time and motion studies are not extremely technical or intricate; they are relatively simple to conduct provided one recognizes a few basic principles.

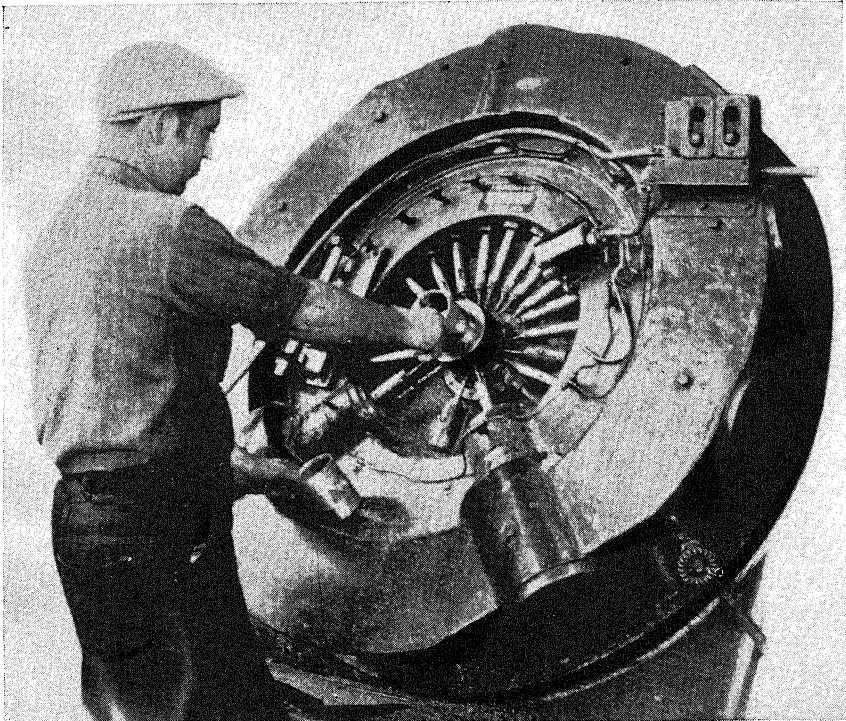



*Figure 15.4.* Less Strain on the Back. (By permission of the McGraw-Hill Publishing Company.)

A very useful principle is that used in determining the most favored work area, sometimes known as the "semicircular work pit." Regardless of whether the employee is doing office work at a desk or assembling at a workbench, this principle can be applied. By circumscribing an arc with your right hand when your elbow is at the hip, and then with your left hand with elbow at hip, you will define a semicircle in which you can work with a minimum of moving and reaching. Then, keeping your back erect, swing your right arm to the left, and your left arm to the

right, and you will define two other semicircles. These two overlapping areas determine a second, and larger, semicircle. This is the area wherein you can reach things with the minimum of stretching and body movement. Most work can be done in the first semicircle; but if necessary, it may be extended to the second one. This semicircular work pit is the most favored work area from the point of view of economy of motion and minimum effort.

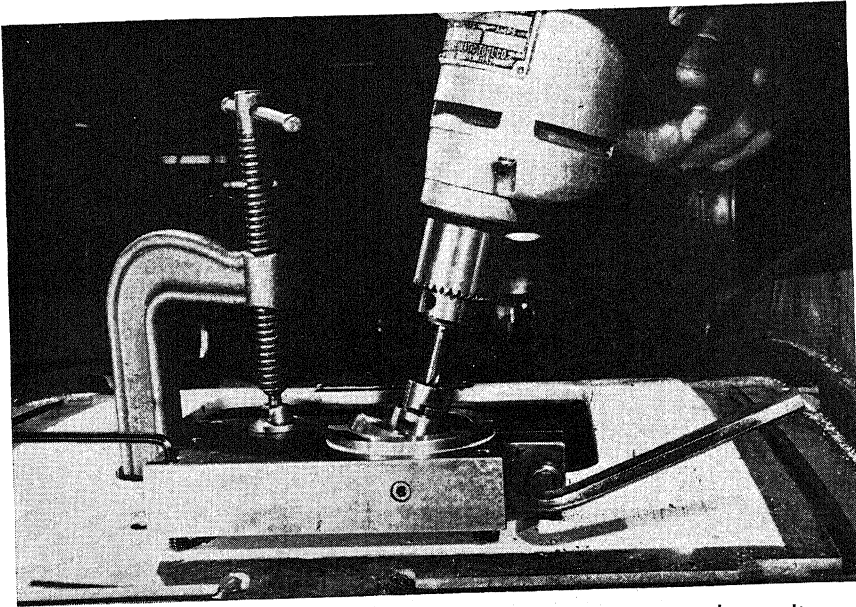



*Figure 15.5.* Ball-and-Socket Drill Block Developed by an Employee. It permits more accurate use of Portable Electric Drills at different angles. (Courtesy of Temco Aircraft Corporation.)

The pre-positioning of tools, another simple principle, is a useful technique in time and motion studies. It avoids much unnecessary delay in looking for tools which have been misplaced. Pre-positioning operates effectively for a bank teller, a shipping clerk, a watch assembler, and many other workers.

The prolonged holding of an object is poor motion practice. The introduction of a jig or a vise to clamp the work will free the holding hand. Most efficiency concepts encourage the use of two hands. Motion of the two hands is most efficient when they are used in opposite and symmetrical direction. Make slight circular movements with both hands,

moving them both to the right as if you were tightening a light bulb in its socket. Then do it again, first moving both hands inward and then both outward. It makes a difference.

The introduction of rhythm in work is also an important principle. Experienced carpenters, typists, and painters have rhythm in their work. In fact, a simple but crude manner of judging work performance and

*Figure 15.6.* Automatic Line Finder. By pulling the lever on the top of the machine forward, the operator can space vertically on her typewriter and increase production up to 300 percent. (Courtesy of Standard Register Co.)

ability is to observe the worker on the job and watch for regular, smooth, and even movements. These encourage rhythm and indicate efficiency. The unsure, erratic, staccato movements of the novice can be detected immediately.

A drop delivery will prevent the cluttering of the work space and the waste of time involved in transferring of the finished product. A hole at the work place leading to a chute which carries the finished product away makes for efficiency and economy. Labor savings of from 5 to 10 percent have often been accomplished by introducing a drop delivery system.

The redesigning of tools and equipment has been an accepted principle ever since Taylor redesigned the shovel. The amateur gardener or farmer would find the new rake shown in Figure 15.7 a welcome improvement.

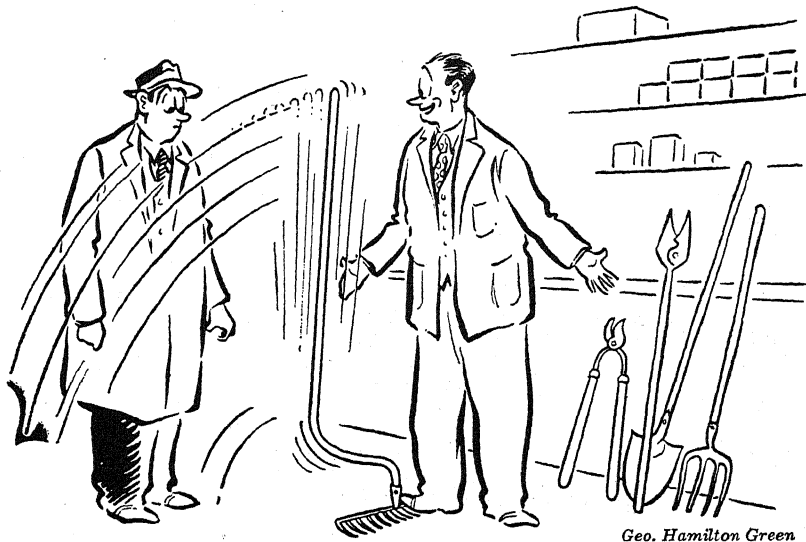
The process chart is a desirable and not very technical device. A process chart records exactly what goes on. It may be a flow chart, which records the flow of work during the process. Or it may be a man-and-machine chart, which records the work of the machine in relation to the work of the man. A third type is the operator chart, which is mainly concerned with the separate work done by the left hand and the right hand. The cost chart, which establishes the cost of the operation, is a process chart that brings new happiness to the accountants in our society.

**"And with this new, improved handle, you can step on it without injury"**

*Figure 15.7.* Redesign of a Rake. (By permission of *American Magazine*.)

Another principle in time and motion study is the reduction of motion. Motions involving only the fingers are considered most efficient because they require least muscular effort. The least efficient motion is one which requires the use of the entire body. It is sometimes claimed that an attempt to reduce motions to such simple levels introduces monotony and related phenomena. Although, from the point of view of efficiency, this may be true in some instances, it must be conceded that the motion that involves the fewest muscles is the least fatiguing to the individual.

### Need for Allowances in Time and Motion Study

After a time and motion study has been made, but before it is put into use as a standard of production or a basis for setting a wage rate, certain

time allowances must be made for it. The four most commonly recognized allowances are (1) differences between the skill and effort of the worker on whom the study was based and the skill and effort of the group performing the task, (2) personal needs, (3) fatigue, (4) unavoidable delays. The first three are related to the human factor, the worker. The fourth is related to production and is largely independent of the worker. Because all machines occasionally break down and need repair, or material supplies may not be available, an allowance is made in connection with work which is determined solely by the motions and speed of a machine. The other three allowances must be made because of individual variability.

A psychologist recognizes the wide variations in human behavior, and when he develops norms he tries first to obtain data on large numbers of subjects. Most standards established as a result of time and motion studies are based upon the production of one, two, or possibly three people, but rarely more. Since the standard thus established will be applied to large numbers of people, the danger in drawing conclusions on the basis of such a limited sample is great. In fact, the weakness of the entire structure of time and motion study may be due to the fact that the sampling is so limited as to give invalid results. The time and motion study people partially recognize this difficulty and attempt to cope with it by making allowances part of their standard procedure. They realize that an individual's skill on the job will vary, as will his effort to produce. People with great skill may put forth little effort, and people with very little skill may exert great effort. The two other combinations—high skill and great effort, and low skill and little effort—are also possible.

In setting a standard, the time and motion study engineer basically and ultimately must use his own judgment as to the degree of skill and effort of the particular worker on whom he is basing the production standard in comparison with that of the other workers. This is a considerable responsibility and demands both skill and effort on his part. His judgment will be reasonable only to the extent to which he is concerned with this problem. By the same token, the extent to which he blindly follows the fashionable inefficient mathematical formula of the moment will determine the extent to which errors are possible. The Bedaux or speed-rating system attempts to solve the skill and effort problem in the manner just described. The writer is not fully convinced of the validity of the claims made for the Bedaux system despite its wide use in the past.

Factors which should be included in the allowances for personal needs

are the employee's visits to the water cooler, locker room, and rest room or lavatory.

The allowance for fatigue, the third human factor, rests ultimately on sheer estimate. The problem of fatigue was discussed in Chapter 14; here we shall say only that susceptibility to fatigue is relative to the individual and that, in many instances, what is called fatigue is not fatigue at all.

The unavoidable-delay allowance is more easily reckoned. A time study expert can take up his post near a machine and record, over a day, a week, or several months, the time consumed by machine repair or by shortages of parts which prevent the employee from doing his work on the machine.

In a survey on the problem of time allowances in 360 plants in the Pittsburgh area, Blair (2) found that 106 of these plants used a stop watch or the time study method to set production standards. The remaining 254 set their standards on the basis of the judgment and experience of either a foreman, a pace-setter, or a worker who was assumed to be an average performer. In some instances, the standard set was based on the speed recommended by the manufacturer of the machine.

Most of the plants studied by Blair did not use a really objective basis for determining allowances, regardless of how they set the production standard. Extra time allowances were determined essentially by an overall estimate of all four factors combined: skill-effort, personal needs, fatigue, and unavoidable delay. The general practice in the other plants was usually to overlook "allowances" completely.

A little-known book called *How to Run a Bassoon Factory* (23), a brilliant and delightfully humorous satire on American efficiency systems, presents the problem of allowances as follows:

He [the time study man] proceeds something like this: (1) He sets a man to work on making a bassoon and times him to one hundredth of a second. This gives him a figure to work on; (2) He then takes his figure and applies the following reasoning (a) It took old Sam two days to make that bassoon, but he was not working as hard as he might, therefore, divide by two equals, one day; (b) Anyhow old Sam is old and not representative, therefore divide by two again equals one half day; (c) on the other hand, old Sam has had a lot of experience, therefore multiply by two equals one day; (d) but there were seventy-nine periods of two minutes where he did not do anything, therefore subtract one hundred fifty-eight minutes, equals five and a half hours. [In the United States five and a half hours equals three hundred and thirty minutes; however, the present author feels that he is not qualified to dispute the discrepancy in time.] (e) But he will get tired in the day so we'll allow him one half hour, therefore, add one half hour equals six hours; (f) on the other hand if the rate is to be tight old Sam will kick up a row therefore multiply by two

equals one and a half days; (g) anyhow, we always leave a bit of margin, so let's call it two days. This is now made into a formula. The numerator is old Sam's time, times two, times two. The denominator is two times two equals (158 – 30 – 33⅓) and by taking old Sam's time and applying this formula we get the scientific determined time of two days. The time study man then works out what it usually pays old Sam, for work, and there you are. This, however, is piece rate in its simplest form. If you particularly wish to acknowledge the worker, it is usual to say that you will pay him seven pence a bassoon for the first ninety bassoons and with each subsequent bassoon 6/90 of a penny. Thus the more he does the more he gets paid but not so much, if you see what I mean, then he strikes and you arbitrate and begin again. The majority of strikes about wages are the result of the worker being unable to appreciate an ordinary logical piece of reasoning like this.

Of course the fictitious Mark Spade is spoofing; but to anyone with a sense of humor some of the rationalizations made in connection with extra time allowances will appear to be little better. These allowances are a serious pitfall in time and motion studies; they should not be overlooked or speedily estimated. They should be based on actual data from a large sample of workers and not from just one or two employees. Estimates of the average worker made by foremen, pace-setters, or experts do not provide a sound or scientific basis for determining extra time allowances in time and motion studies.

Lifson (*13*) conducted an experiment which raises further questions on the accuracy of judgments in time study. He had six expert time study men make ratings of the filmed performance of five workers doing each of four jobs at each of five previously established paces. He found that the experts had different concepts of normal pace. Further, there was a marked trend to underrate fast paces and overrate slow paces. In fact, lack of agreement was found among experts' ratings on both job performance and the job.

The objective evidence that experts differ in their judgments is not new to psychologists. The fact that it applies to time study experts means that the general practice of having a single rater determine standards may lead to gross errors in "standards" and pay rates. Having more than one time study expert do the rating and combining their judgments might well lead to greater objectivity.

Pace rating or leveling involves considerable error and experts differ in the extent to which they err. The total error is a result of the time study man's concept of normal work pace as well as his rating of each worker (and this varies) and each job (this also varies).

The time study should be regarded as a technique which may not be

objective and factual. It should be rigidly inspected as to methodology and statistics before its conclusions warrant acceptance as standard. Perhaps Gomberg of the ILGWU is reasonably correct: It provides a basis for bargaining.

### Time and Motion Study in the Home

It must be emphasized that time and motion studies are not merely a concern of big business and big unions. The application of these studies

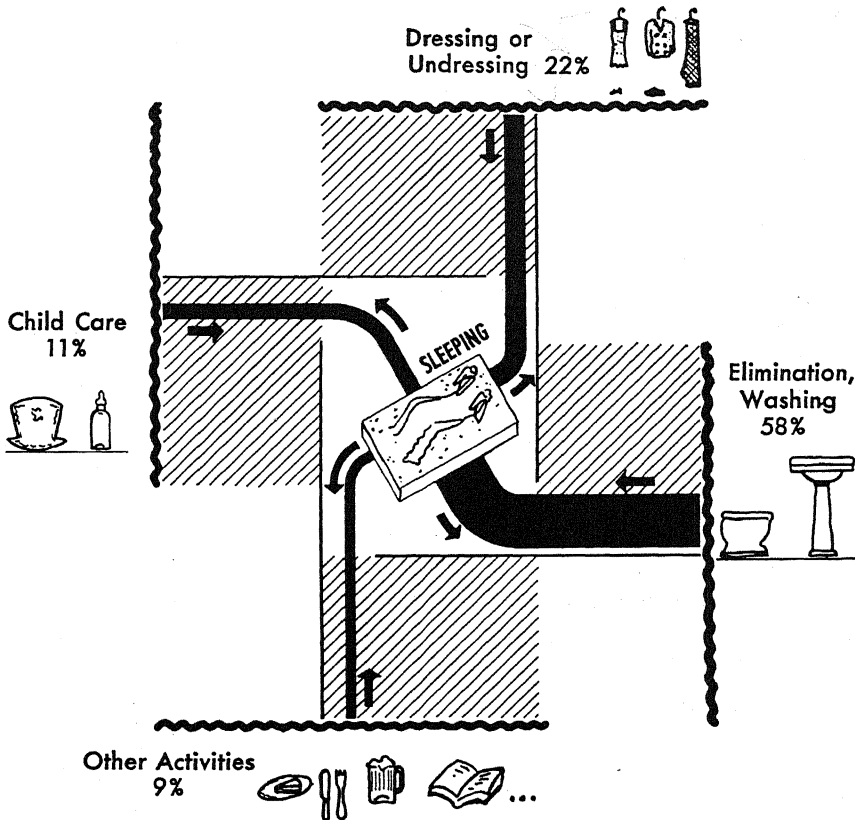



*Figure 15.8.* Activities Related in a Time Sequence to Sleeping. Such study can result in more effective design of space surrounding the bedroom. (From Milton L. Blum and Beatrice Candee, *Family Behavior, Attitudes and Possessions,* Vol. 4, New York, The John B. Pierce Foundation, January, 1944, p. 203.)

has also resulted in increased efficiency in the home. Marvin E. Mundel and Janet Armstrong (*19*) have done much work in applying the findings of these studies in the home. They recommend six rules of efficiency:

1. Eliminate all unnecessary parts of a job. For example, in dishwashing, use very hot water and let the dishes drain dry; do not wipe them.
2. Keep everything within easy reach, i.e., the coffee pot, coffee can, and measuring spoon should be stored close together in a cabinet.
3. Use the best tool for the job. For instance, use a step-on can with a removable inner sack for garbage.
4. Use both hands for such work as putting away dishes or stacking fresh linens.
5. Combine two jobs into one; for example, fold pillow cases with the free hand as they are ironed.
6. Whenever possible, sit down to work—when preparing vegetables or feeding the children, etc.

These six rules for efficiency in the home are similar to the rules regarding efficiency in industry. Housewives and their husbands are not likely to object to new methods which will make housework less of a burden. By the same token, employees are not likely to object to efficiency methods which make their jobs less of a burden, providing they are not subjected to a speed-up or made to feel their position is insecure. Any small office, shop, or factory can improve its efficiency tremendously by applying the principles recommended here.

### Examples of Continued Inefficiencies

Two popular and widely used machines in the present era are notoriously inefficient—the typewriter and the sewing machine. The typewriter now in use makes it necessary for the left hand to do 57 percent of the work. August Dvorak has rearranged the keyboard so that the right hand does 56 percent of the work. This keyboard makes it possible for trained typists to do between 165 and 180 words a minute. Its arrangement is as follows:

7 5 3 1 9 0 2 4 6 8<br>
? , . P Y F G C R L /<br>
A O E U I D H T N S -<br>
, Q J K X B M W V Z

Another widely used inefficient machine is the sewing machine. The present electric machine requires that the left hand, which is ordinarily less agile, do more work than the right. This is the case not because the machine was designed by a left-handed person, but because originally the right hand did the important work of starting and stopping the machine as well as regulating the wheel. In the electric sewing machines the right

hand is relieved of this task. The present position of the needle head at the left does not allow the right hand to feed conveniently the material to be sewed. Turning the machine around would probably result in greater accuracy and speed of operation. However, this will probably not be done, nor will the Dvorak typewriter keyboard gain immediate popular acceptance. This can be understood, primarily, in terms of resistance to change. It must, however, be added that although the use of the present typewriter and sewing machine may be irrational in terms of ultimate efficiency, it is rational to the individual employer who has a capital investment in these machines. It is also rational to individual operators who can use the present machines but would have to learn to operate a new, even though more efficient, machine.

### Breaking Resistance

One of the simplest aids in breaking a person's resistance to change is to ask him to write his full name, leaving out every other letter. After the signal "Go," time him accurately with a stop watch; then without any comment, ask him to write his full name in his usual manner, and time him. It will be seen that writing the name using only half the letters takes just as long as writing the full name, and sometimes longer. Tell him the length of time it took to do both tasks. Of course, he will object. Usually people say, "But I am used to writing my full name, and writing just every other letter required effort!" You then counter with, "Yes, you are used to doing the job in one way, but won't you admit that a short amount of practice will probably result in your signing your name in approximately half the time?" Most people will accept this, and you continue, "Then you may admit that doing your job this new way will, with practice, eventually require less effort and time."

Another simple means which can be used to break resistance to change is to ask a male employee to describe in detail how he puts on his suit coat. Then ask him to put on his jacket and call his attention to the discrepancy (there usually is one) between his description of an often-performed task and the actual performance. Time him while he is putting the coat on. Then ask him to take it off and put it on again, but this time have him start with his right hand rather than his left. Many people experience considerable difficulty with the left-hand right-hand reversal, but it serves to drive home the point that new tasks or operations are sometimes judged more difficult solely because they are new, and not because they are more difficult.

### Human Engineering

The increase in mechanization has led to a shift in emphasis from studying the time and motions involved in the performance of a job to an awareness that man and machine must function in relation to each other. Engineers design machines and are justifiably concerned with effective-

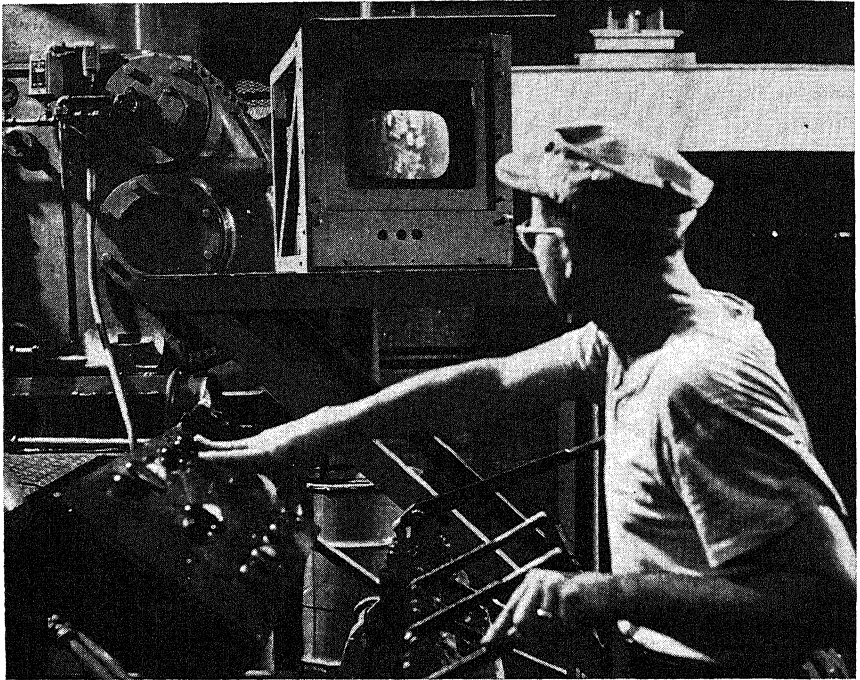



*Figure 15.9.* This Employee Watches Industrial TV. His job is to operate scrap balers and to see that bales fall into a gondola car spotted outside the building. He watches the gondola via television. When the car is full, he can, by remote control, move it out of the way and move in an empty car. (From *Fortune*, September, 1951. Photo by Jerry Cooke.)

ness and efficiency. However, principles of physics and engineering are not enough as long as man is a necessary accompaniment to the workings of a machine. A machine, no matter how complex and automatic, requires a man to make judgments in connection with its continued performance (Fig. 15.9). Whether he serves as an operator or as a maintainer of a machine, he reacts to signals from the machine in accordance with his abilities, characteristics, and limitations. Because of this, the

psychological aspects of man-machine systems cannot be avoided. Further, the transmitting of signals from the machine is through dials, scales, pointers, or sounds. Sometimes speed is important; sometimes accuracy is important. Usually both speed and accuracy are desirable. Accordingly the size, shape, position, pointer, lettering, or illumination of the signal becomes a factor in man's ability to respond more accurately or more rapidly.

The sum total means that problems in machine design are definitely and intimately related to human ability and limitation. This field of relating man-machine systems is known as human engineering or engineering psychology.

Its growth has proceeded at an accelerated pace since World War II, when its importance was clearly recognized. Planes, guns, and other military equipment became more complicated, and as electronics became more usable, the increase in necessary dials, levers, knobs, and controls created problems. The interrelatedness of machine performance and operator performance must continually be recognized.

Psychological research on equipment design has stemmed mainly from a series of practical problems. In solving these problems a system has arisen which emphasizes the importance of psychological knowledge, facts, and methodology.

Fitts (*4*) distinguishes between display and control problems. A display is any device that can be used to present information to individuals by visual, auditory, or the other senses. A good display should be rapidly and accurately detectable. Control design is concerned with the utilization of human effort in directing a machine. The dial on the radio set is a display indicating station whereas the knob is an on-off or volume control. The problems of accuracy of tuning require vision, touch, and hearing, and one or two hands may be used. The automobile is a more complicated machine to operate. The gas pedal is a control but speed is determined by seeing a marker on a dial—or a motorcycle policeman.

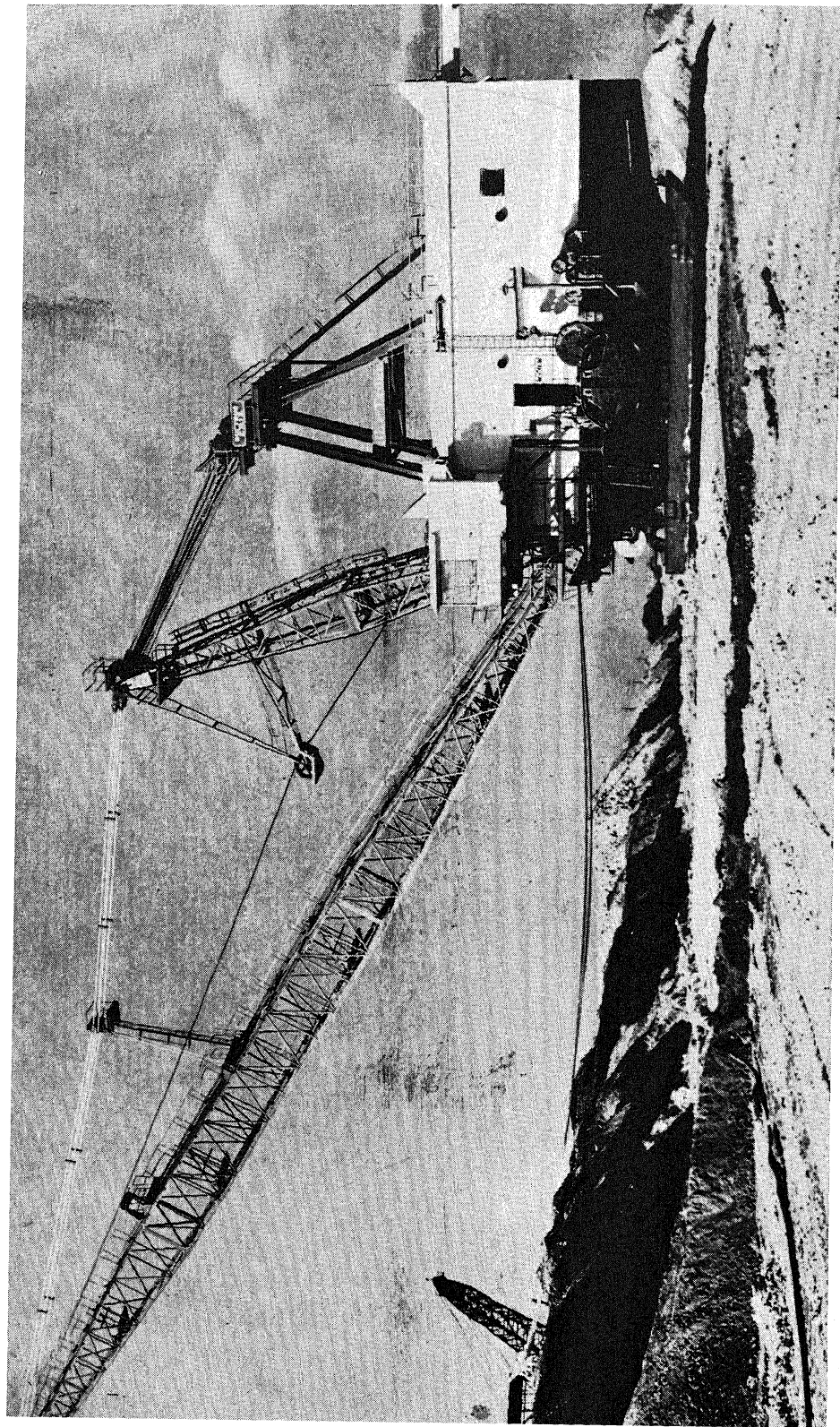
Dunlap and Associates have specialized in the extension of the field of human engineering with reference to industry. A good illustration is their work in the remodeling of the cab of a dragline used by the International Minerals and Chemical Corp. A study of the dragline (see Fig. 15.10), a million-dollar machine, revealed that it was operated by one man who was seated uncomfortably, exposed to the elements, and unable to see what he was supposed to be doing for much of the time. In addition his job required awkward movements of both hands and feet.

*gure 15.10.* "Tillie the Toiler." Real control over $1-million dragline is possible with operator's new position giving good visibility, precise ormation, comfortable working place, accurate, easily operated controls. "Tillie" is a $17\frac{1}{2}$-yd. bucket, 185-ft. boom. (From *Engineering and ning Journal*, April, 1954.)

Figure 15.11 shows the main features of the redesign which resulted in improved vision, increased comfort and easier controls. In addition a communication system was introduced which enables the operator to talk to his oiler, pit man, pump man or the head office.

Another redesign job of Dunlap and Associates involved the electric

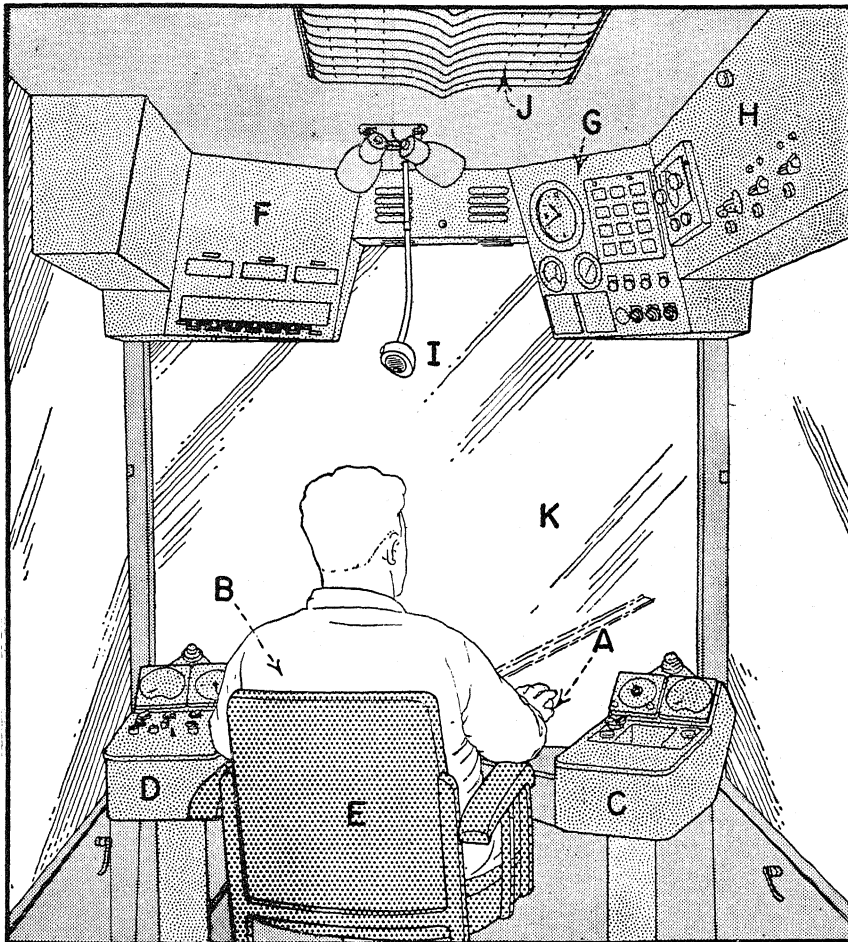



*Figure 15.11.* Key to New Cab International Minerals & Chemical Corp. Builds for Its Draglines. A, hoist-swing control lever; B, drag control (operator's left hand); C, digging control indicators; D, switches, drag indicators; E, movable chair; F, tonnage totalizers; G, "Trouble-spot" indicators; H, radio cabinet; I, microphone; J, fluorescent lighting; K, plate glass windshield with wipers. (From *Engineering and Mining Journal,* April, 1954.)

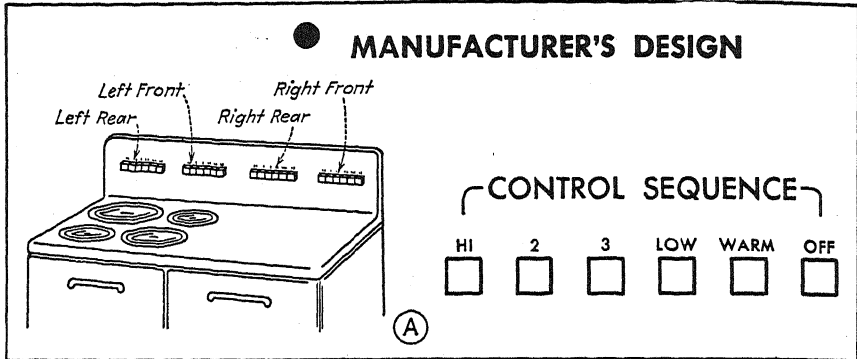



*Figure 15.12.* Pushbutton Control System for Electric Range, Case History A: Left, manufacturer's original version of an electric range with the controls positioned as shown on back panel. Right, sequence of cooking-speed pushbutton controls violates good human engineering, since it does not increase in the normal order of magnitude from left to right. (From Jack W. Dunlap, Introduction to human engineering in product design, *Electrical Manufacturing,* March, 1952.)

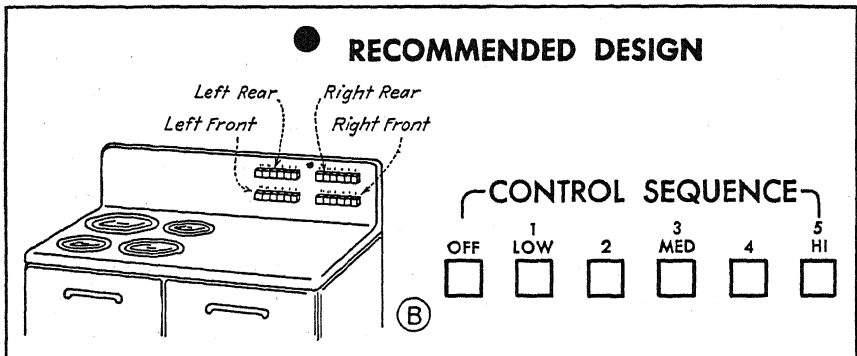



*Figure 15.13.* Pushbutton Control System for Electric Range, Case History B: Left, recommended redesign of pushbutton control panel provides better relationship to heating units and easier operation. Right, the recommended redesign of pushbutton sequence showing proper order of increasing magnitude from left to right, also improved clarifying labels. (From Jack W. Dunlap, Introduction to human engineering in product design, *Electrical Manufacturing,* March, 1952.)

stove. Figures 15.12 and 15.13 show the before and after and illustrate the simple principles involved.

Once redesign takes place the usual reaction is that in the first place this is not psychology and in the second place this is easy and requires

no special knowledge. Actually such arguments are ridiculous. Human engineering has come up the hard way. It is a bold recognition of attempting to fit the machine to meet man's abilities and limitations. When human engineering is successfully applied to the automobile we will have a better distribution of instruments on the panel, the visibility will be improved, glare will be eliminated, and auditory signals may successfully curb relatively innocent speeding when ordinary visual cues are lacking as is the case on super-highways.

The collection of studies in the field of human engineering has led to principles related to the design of displays and controls. Some of them are as follows: A fixed dial with a moving pointer is better than a moving dial with a fixed pointer. For speed in dial or counter reading, the finer the markings, the better. An open window type dial (direct reading counter) is best for rapid reading. All dials indicating increasing magnitudes should rotate in the same direction, preferably upward or clockwise. Whenever possible, displays should be at eye height. Spacing between markings on dials should be consistent and the distance should be about one-half inch. Shapes, sizes and colors of controls should be designed to reduce or eliminate confusion errors.

Knobs in close proximity might best be designed according to different and readily discernible shapes. Jenkins (*12*) found the 11 shapes shown in Figure 15.14 to be readily identifiable by touch, even when gloves are worn. Even though this research was related to aircraft, it is entirely possible that such designs of knobs would be appropriate for automobile dashboards and other types of machines.

A good illustration of the recognition of the problem of man-machine systems is McFarland's (*16, 17*) work on automobiles and other kinds of vehicular equipment. The principles of human engineering have been applied in the evaluation of current vehicles with the hope of achieving in future models a more effective integration of drivers and their equipment.

In one study an attempt was made to evaluate the cabs of twelve vehicles. Its purpose was to determine the optimum arrangements of controls, displays, seating, and window areas for the most comfortable, efficient, and safe vehicle operation. The thesis of the study is essentially based on the fact that since man cannot be redesigned it is necessary to start with man and design the machine around him. Essentially this is the clear distinction between human engineering and engineering. In engineering the machine is designed first. In human engineering the rec-

ommendation is to design the machine to conform with human needs.

The study by McFarland et al. found many defects in design of truck cabs. For example, it appears that satisfactory design of the instrument panel has been sacrificed for aesthetic appeal. By observation it appears

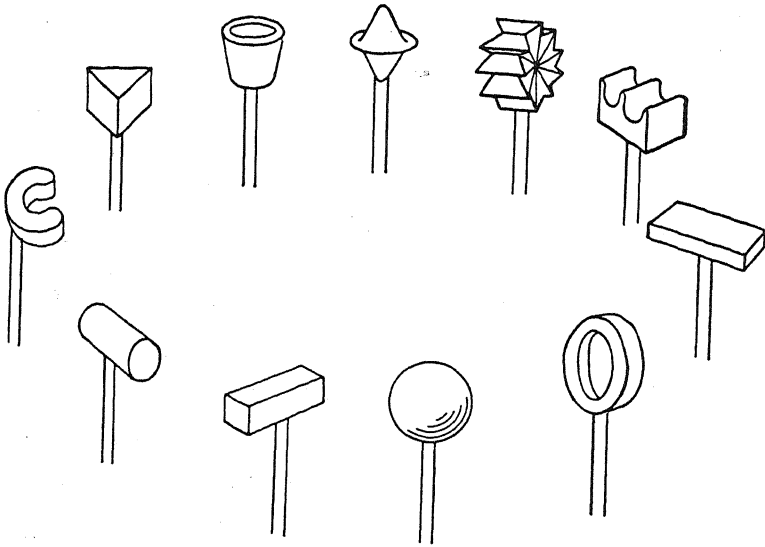



*Figure 15.14.* Eleven Knob Shapes That Are Readily Identified by Touch. (From W. O. Jenkins, Tactual discrimination of shapes for coding aircraft-type controls. In P. M. Fitts, *Psychological Research on Equipment Design,* Washington, Government Printing Office, 1947.)

that this is even more true when applied to passenger cars. In trucks the dials are placed too far to the driver's right, possibly as a concession to symmetry but surely as a contribution to ineffectiveness. Brake pedals are often placed too close to the accelerator and the emergency brake sometimes is not conveniently accessible.

An inspection of Figures 15.15 and 15.16 reveals the difference in location and design of two dashboards. The question that may realistically be asked is, How did they get that way and why?

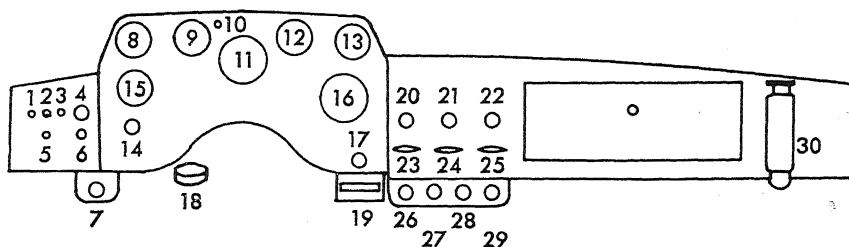
Much remains to be achieved in the design of trucks in order to allow man to use his abilities more than his limitations. Figure 15.17 shows the confining sleeping quarters and the inability to back up a truck from the normal driving posture.

| INSTRUMENT | TYPE OF CONTROL |
|---|---|
| 1. Marker Lights | Toggle |
| 2. Panel Light Dimmer | Toggle |
| 3. Dome Light | Toggle |
| 4. Lights | Push-Pull |
| 5. Fuel Tank Switch | Toggle |
| 6. Starter | Button |
| 7. Wipers | Knob |
| 8. Fuel | Dial |
| 9. Temperature | Dial |
| 10. High Beam | Light |
| 11. RPM Indicator | Dial |
| 12. Oil Pressure | Dial |
| 13. Amperes | Dial |
| 14. Ignition | Key |
| 15. Air Pressure | Gauge |
| 16. Speedometer | Dial |
| 17. Engine Primer Control | Push-Pull |
| 18. Front Brake Control | Knob |
| 19. Compression Release | Hand Pull |
| 20. Left Side Vent Control | Push-Pull |
| 21. Top Vent Control | Push-Pull |
| 22. Right Side Vent Control | Push-Pull |
| 23. Throttle | Push-Pull |
| 24. Emergency Engine Stop | Hand Pull |
| 25. Idle Control | Push-Pull |
| 26. Heater | Knob |
| 27. Defroster | Knob |
| 28. Water Valve | Knob |
| 29. Air Control | Knob |
| 30. Ether Bomb | |

*Figure 15.15.* Dash Board, Code No. 240. (From R. A. McFarland, J. W. Dunlap, W. A. Hall, and A. L. Moseley, *Human Factors in the Design of Highway Equipment, A Summary Report of Vehicle Evaluation,* Boston, Harvard School of Public Health, 1953.)

This study made it apparent that more information was needed in regard to human body size and capabilities, and so a series of anthropometric measures of man in relation to driving requirements were made. An operator of a vehicle must not have unreasonable demands placed upon him if he is to operate controls and react to displays in an effective manner.

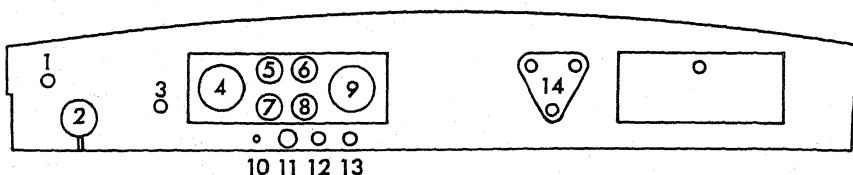
The complete study of man-machine systems requires at least three phases: (1) operational job analysis, (2) the study of man's limitations,

| INSTRUMENT | TYPE OF CONTROL |
|---|---|
| 1. Wipers | Knob |
| 2. Hi-Low Shift Range | Knob |
| 3. Lights | Push-Pull |
| 4. Air Pressure | Gauge |
| 5. Fuel | Dial |
| 6. Amperes | Dial |
| 7. Oil Pressure | Dial |
| 8. Temperature | Dial |
| 9. Speedometer | Dial |
| 10. High Beam | Light |
| 11. Ignition | Key |
| 12. Throttle | Push-Pull |
| 13. Choke | Push-Pull |
| 14. Heater Controls | Knobs |

*Figure* 15.16. Dash Board, Code No. 220. (From R. A. McFarland, J. W. Dunlap, W. A. Hall, and A. L. Moseley, *Human Factors in the Design of Highway Equipment, A Summary Report of Vehicle Evaluation,* Boston, Harvard School of Public Health, 1953.)

both physical and psychological, and (3) the environmental conditions of work.

**Summary**

Time and motion studies are used to establish a method for performing a task with fewer and simpler motions and in less time. Unless the psychological aspects of these studies are considered, they are likely to meet with considerable resistance on the part of employees and ultimately to

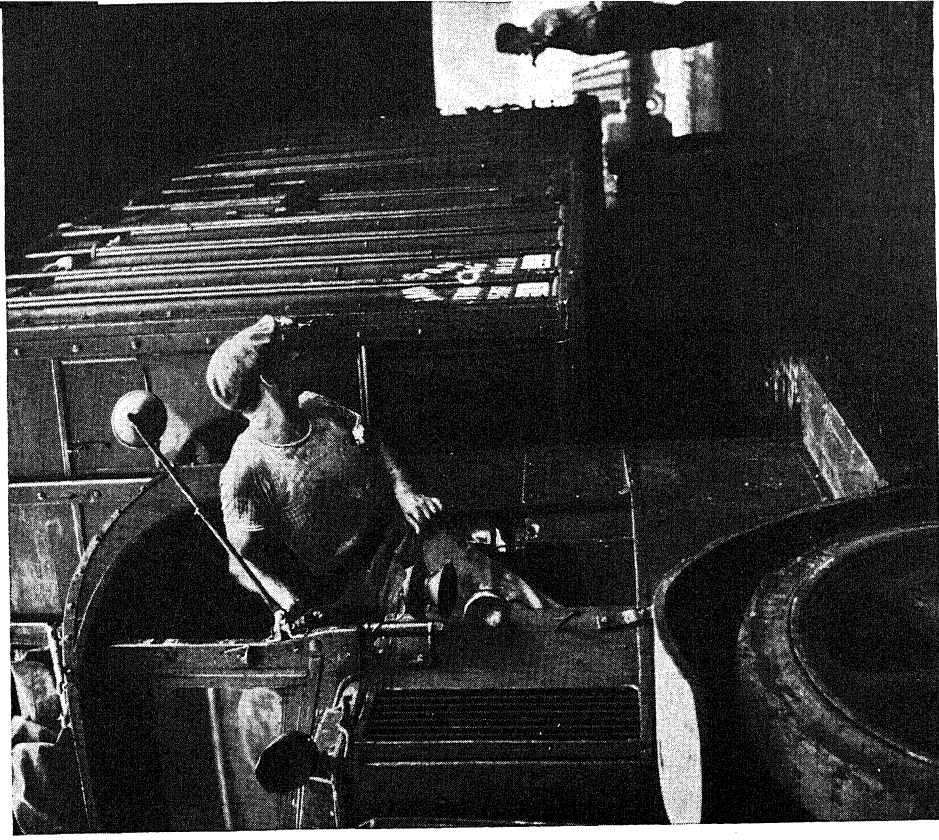
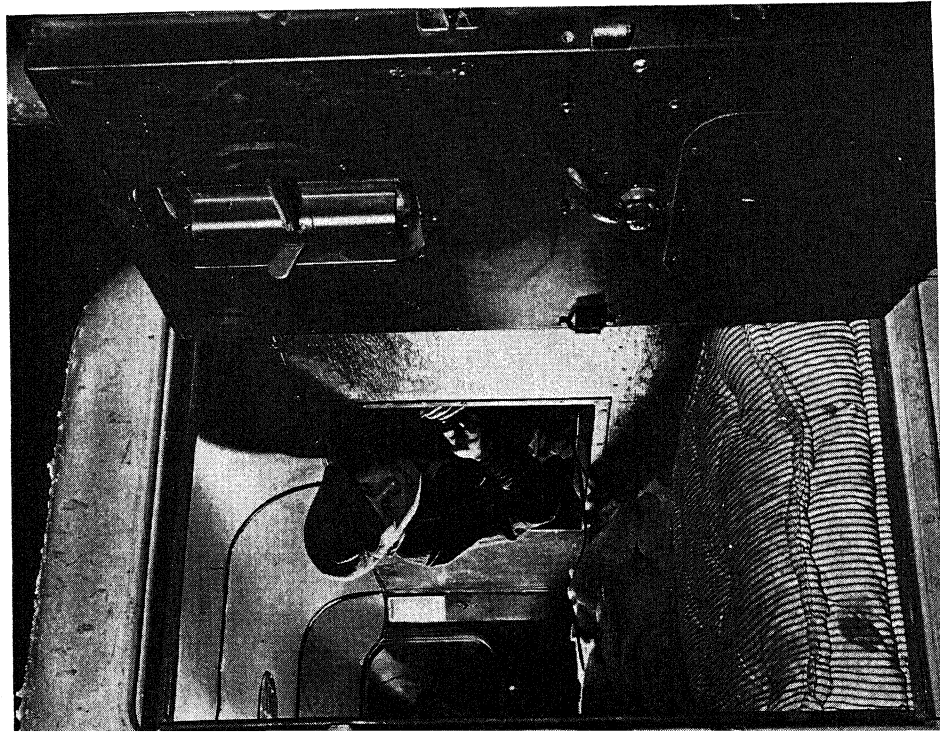



*Figure 15.17.* Trucks Must Be Designed to Perform Many Functions. *Left:* On this run drivers generally take 4 hours sleep, drive 4, keep trucks going 24 hours a day with only brief stops for meals and coffee. *Right:* Trucks may not be designed to permit the driver to back them up easily. (Courtesy of Standard Oil Co. [N.J.].)

fail. The three major employee objections to time and motion studies are: dislike of new things, resistance to changes initiated by outsiders, and the unwarranted speed-ups, cuts in production rates, and related job insecurity which have resulted from the misuse of these studies.

The first person to introduce efficiency studies was Taylor, who increased production considerably by the introduction of rest pauses and controlled work via close supervision. The Gilbreths, who followed, placed their major emphasis on motion analysis. In addition, they recognized that man was not a mere machine but a human being with definite psychological qualities which had to be considered. Mogensen's approach is considered the most useful by the present author and probably the one with the greatest chance of success. Mogensen recognizes the dangers of and the accompanying resistance to the initiation of change by outsiders, as well as the chances for misapplications. His system of time and motion study is based primarily on training employees and foremen and on encouraging their becoming "motion-minded."

The fact that time and motion studies are not solely a tool of management but may also be used by labor unions has been demonstrated by their successful application by the International Ladies Garment Workers Union, especially in setting piece rates and negotiating wage rates with management.

Time and motion studies need not be the technical and intricate affairs which most people believe they are. Process charts, the semicircular work pit, the drop delivery, the pre-positioning of tools, the classification of motions, and the introduction of rhythm in work are relatively simple techniques which are of the essence of these studies.

The estimation of time allowances is a major difficulty in time and motion studies. The errors in these estimations present so serious a problem that it tends to weaken the entire structure of the technique. The four usual time allowances are those for (1) differences between skill and effort, (2) unavoidable delay, (3) personal needs, and (4) fatigue. In other words, time and motion studies are the results of human judgment and not as objective as the split-second timing would indicate. Judgments of multiple judges may improve the accuracy of the studies.

Time and motion studies are applicable not only in large industrial organizations but also in small factories, offices, and the home, with equal success. The introduction of new work methods will meet with resistance, but there are simple, relatively successful ways of overcoming this resistance.

Human engineering is the psychologists' extension of time and motion studies. It is the attempt to make man-machine systems more integrated by recognizing that the machine must be designed according to man's abilities and limitations. It clearly recognizes that displays and controls enable man to operate the machine and that man's responses are accurate or speedy in relation to his ability to react to signals, levers, or what have you.

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## CHAPTER 16

# Training and Learning

**TRAINING** is a process that develops and improves skills related to performance. Effective training programs can result in increased production, reduced labor turnover, and greater employee satisfaction. They should include all employees, from factory workers to executives, and apply not only to inexperienced workers but also to experienced workers new to the company. A training program should also include those who are promoted to higher level jobs and the retraining of old employees by means of "refresher" courses.

Despite the fact that job training should be one of industry's responsibilities, there are many companies which seem to do their best to avoid it. Industry in general has attempted to get around the problem of training in two ways: (1) It insists on hiring skilled or experienced workers on the assumption that training will be unnecessary, or (2) it hires inexperienced people and turns them over to experienced employees for training, under the mistaken belief that a worker who is experienced but has no knowledge of training techniques can train an inexperienced person. Nothing is farther from the truth. Although learning can take place without effective aids, it is uneconomical because it takes longer and does not permit the ineffectively trained worker to reach his maximum output.

The National Institute of Industrial Psychology carried out a series of experiments on two equated groups of worker. The essential difference between the groups was that one was hired and trained for the job it was to perform, and the other was put to work at the job in the usual manner. An investigation of about ten different jobs led to the conclusion that the trained group was from 10 to 40 percent more efficient than the untrained group.

Psychologists have gathered sufficient information in the laboratory, the

classroom, the armed forces, and to a certain extent in industry to permit the knowledge about training to be classified into a series of general principles. When these principles become recognized and are included in a training program, training will be considerably more efficient.

### Experience vs. Training

Industrial workers are likely to regard with disfavor the inroads made by education. Many experienced workers seem to be members of a "secret society," with mysterious knowledge all their own which has come to them only after long years at a workbench. We often hear an experienced worker or a successful boss telling a young college graduate or a person who has studied the specific task in school that "this education business" is nonsense. The argument runs somewhat as follows: "Look where I am, and I didn't have any education." How much of this is discrimination, or fear of young people, or resistance to modern trends, and how much of it is sour grapes is hard to tell. On the other hand, people with formal training sometimes tend to belittle those who have gained their knowledge by experience. This merely pours salt in the wound. A young person with training but with little or no experience should use judgment and curb his missionary zeal by not insisting that he must train all those who have not had his training. This is just as ridiculous as the experienced employee's objecting to anyone who has been trained.

Training cannot entirely take the place of experience, but when training is effective it can shorten the time required to reach maximum production. In fact, the training of new people is often the only means of introducing new and efficient work methods as a substitute for older and less efficient ways of doing a job. Experience can be a good means of training but this result is sometimes accidental. Experience that depends solely on trial and error or on the prodding of a poor teacher means trouble and a much longer uphill struggle to achieve competence. However, experience and training are not incompatible as methods of learning; in the proper proportion, both lead to the highest efficiency and maximum achievement in the shortest time.

Training, like education, can be regarded as a continuing process of life. This means that refresher courses are a "must" in any comprehensive training program. Of the many reasons for periodically retraining experienced employees, the most pressing one is the appearance, slowly but surely, of strange and inefficient work methods which interfere with the efficient methods learned originally. In addition to ironing out the kinks

and removing the "bugs," refresher courses permit the continual introduction of new and improved work methods; they also serve to bolster morale since the individual employee is assured that the company is still aware of his existence.

The role of motivation is very important in learning; little if any progress occurs without it. Whereas students often spend three inefficient years in school attempting to learn a foreign language, the Army's recent experience demonstrated that the average person can be trained to conduct a conversation in a foreign language in a matter of months. Only part of this vast difference in effectiveness is attributable to better teaching techniques; most of it is due to the stronger motivation in the Army. The GI could be made to understand the reason for studying a foreign language much more readily than the high-school student; the latter was probably convinced that it was just a useless requirement imposed on him by a "bunch of old fossils."

Effective motivation is the essence of learning; unless one who is teaching a group takes pains to insure correct motivation, little learning is likely to occur. A man who has been promised a promotion provided he takes a specific course will learn its content in a comparatively short time. A girl who hopes to obtain a job as secretary will learn to type and take dictation in as little as six weeks. Without the specific motivation of a job, both these individuals may dawdle along for years. Many college students insist that they learned the entire content of a course in a few nights. In the "cram" session they discover that there is much useful material that they should have learned during the course, but the motive for learning was too remote then. When passing the final examination is their only motive for learning, they learn.

A difficult problem in connection with the learning process is the determination of the length of the learning period.

### Principles of Learning Applicable to Industry

To be practical, when one is involved in the training of others it is best to recognize that a number of fundamental considerations are necessary. The following check list of ten items can serve to enhance the training process. Decisions are required in connection with each and the difficulty is that too often facts and data are lacking which would determine the best manner of organizing the training course. This would indicate that research on the training process is as necessary as training itself.

A good start, however, considers the following items:

1. Motivation is not only a desirable but often a necessary accompaniment of learning.
2. The number of units or lessons to most effectively teach must be decided upon; too often it is arbitrarily set.
3. The amount to be learned in any one unit must be planned. For optimal learning the unit should be neither too large and complex nor too simple.
4. Any training is practically never comprehensive or exhaustive. The amount to be learned has to be related to the desired job performance. For example, a person need not know how a motor operates in order to drive a car.
5. The task to be performed should be demonstrated.
6. The demonstration must be immediately followed by the doing on the part of the learner.
7. A discussion and question period should follow the doing, to clear up any misconceptions on the part of the learner between the explanation of why and the demonstration of how.
8. Ample and adequate practice opportunity should be encouraged. Some learners tend to overestimate their performance and erroneously believe that the task has really been learned.
9. Observable progress during practice goes a long way toward encouraging a sufficient degree of practice. Plotting the learning curve wherever practical is to be encouraged.
10. A summary and review of the entire learning process should be made by the learner with the teacher available for last-minute pointers and to establish that the task has been learned according to performance that meets the criterion or standard.

Should a training period last one day, one week, or months? Should a training session continue for one hour, two hours, or a day? A determined effort should be made to relate the job requirements and the skills necessary to the likelihood of effectively teaching the task in a most economical and efficient manner. Although this varies from task to task, the average person is not capable of continually absorbing new material. Signs of "fatigue," boredom, inattention, and other aspects of inefficiency should determine the length of the period as well as the amount to be learned in the unit. Rest pauses and breaks in the learning process should be introduced. When learning mental tasks, a 10-minute rest every hour not

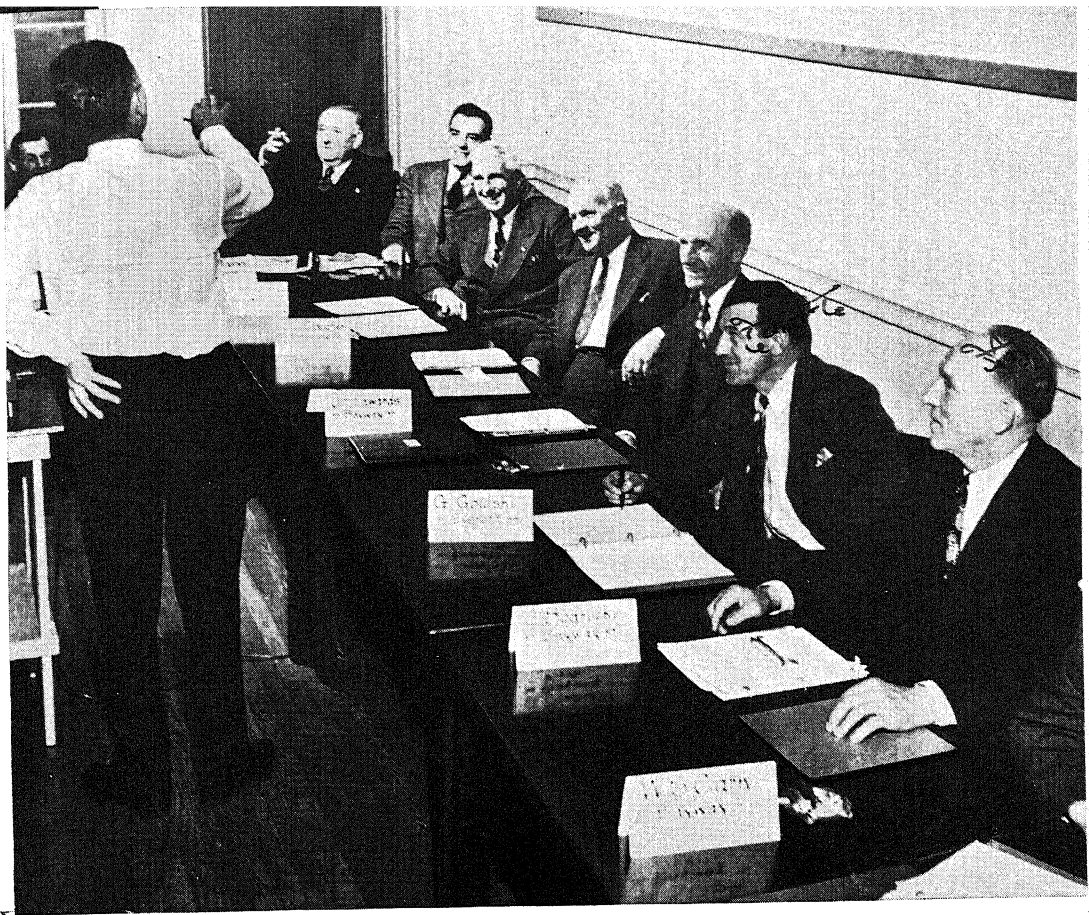
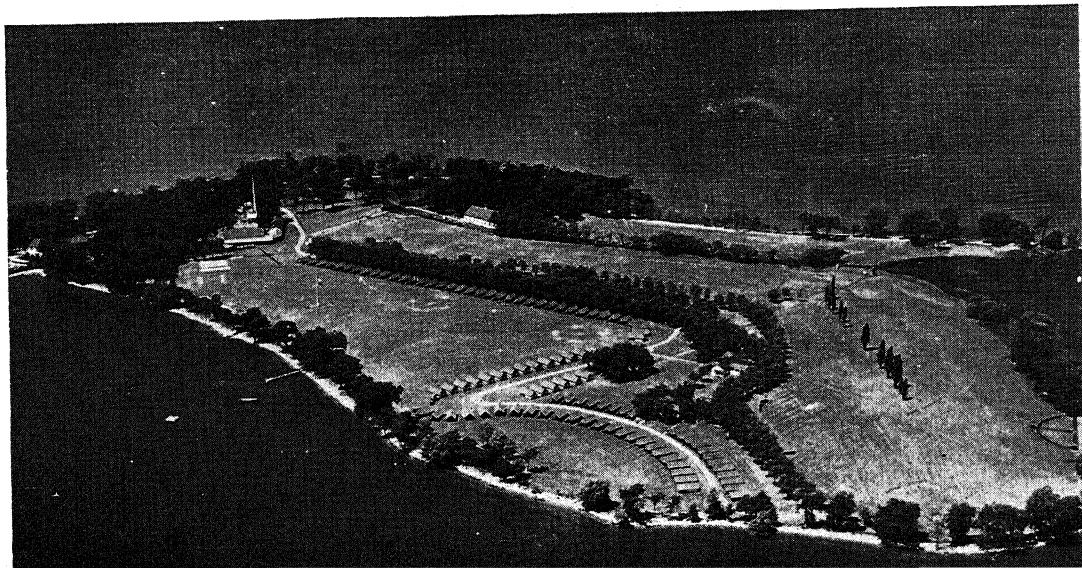



*Figure 16.1*. Supervisors Need Training, Too. *Top:* The conference room. (Courtesy of Standard Oil Co. [N.J.].) *Bottom:* An island retreat for executive training. (Courtesy of General Electric Co.)

only is welcome but aids in the learning process. In learning motor activities, fifteen minutes to half an hour is about as long as a learning period should be without a rest; however, this varies with the type of activity. The length of the training period should be given careful attention, because too long a period will often do more harm than good.

Another decision which must be made concerns the amount to be learned. Although psychologists generally favor the learning of a complete unit because of its meaningful nature, they recognize that a complete unit can be broken down into smaller but equally meaningful parts. This applies to such students as tile setters, carpenters, and typists as well as students in college courses. It is up to the instructor to integrate the material so that the student can fit the parts together correctly. Unless the individual has learned to perform the various parts of the unit correctly, the complete unit will give him difficulty.

In training a person to perform a task, the teacher must often be content in not teaching the whole truth. While this sounds amoral it is nevertheless pragmatic. A person can learn to play a guitar without a knowledge of theory; he can also learn to reject imperfect parts without knowing how, when assembled, they fit into the machine. One must teach in relation to expected performance.

Telling is not enough. The person should be shown. This requires the trainer to do the task and often in a slower fashion than his experienced pace normally sets. As soon as is practicable and depending on the size of the unit the student must be given the opportunity to perform the task himself. At this point the integration between the verbalization of principles of performance and actual behavior can occur if free and ample opportunity for discussion and correction of performance, without embarrassment, takes place.

Learning by doing and redoing is well worth remembering. This means that practice is necessary if skills are to be improved. Learning to play the piano is essentially a matter of practice. Many readers will remember their aversion toward practice and understand why they did not learn.

An effective aid in learning is knowledge of progress. The Marrow study referred to in Chapter 6 showed clearly that when the subjects knew they were making progress toward intermediate goals more of them achieved the final goal. When the unit to be learned was too large and the goal too remote, it seemed as though no appreciable progress was made. When progress in the task to be learned can be shown graphi-

cally, this should be done by the student. Thus the amount of type set in a five-minute interval, measured once every hour or two during the learning process, will act as a tonic to the apprentice typesetter; and counting the number of words typed in a five-minute interval will show the student typist his progress in concrete form.

Regardless of the task involved, a clear similarity in the learning curve from task to task is evident. The curve is often characterized by a rapid increase in the earlier learning period and a tapering off toward the end of the process. The pioneer studies in this area conducted by W. L. Bryan and N. Harter (*1*) prior to 1900 resulted in the establishment of a learning curve for telegraphy; this is reproduced in Figure 16.2. An-

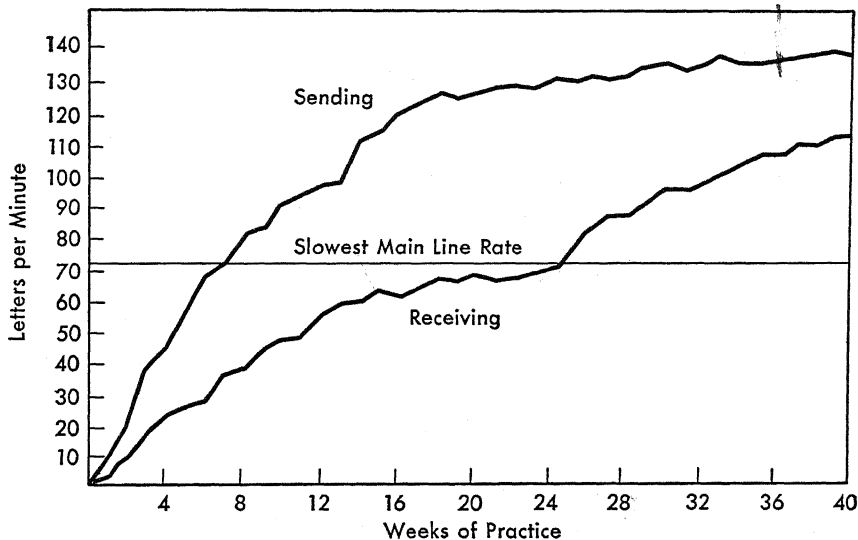



*Figure 16.2.* A Learning Curve. (From W. L. Bryan and N. Harter, Studies in the telegraphic language, *Psychol. Rev.* [1899], *6*:346–376.)

other learning curve (*14*) is depicted in Figure 16.3 to show the similarity in such curves.

Familiarity with the typical learning curve allows for comparison between it and any specific learning process in a particular plant. Marked deflections of the curve, if they are frequent, are likely to indicate that something is wrong with the training method. Since the quality of the teaching is vitally important, wide variations in what is learned are often the result of either efficient or inefficient teaching. Anyone who has ever

been to school knows the difference between a good teacher and a poor one; it cannot be assumed that everyone can teach equally well.

Too often the concept "plateau" appears in connection with the learning curve. This is an overstated and overworked idea. Sometimes there is a flatness in the learning curve which is eventually followed by a spurt. This flattening indicates a period of no apparent progress and is referred to as a plateau. There are many reasons for the appearance of a plateau

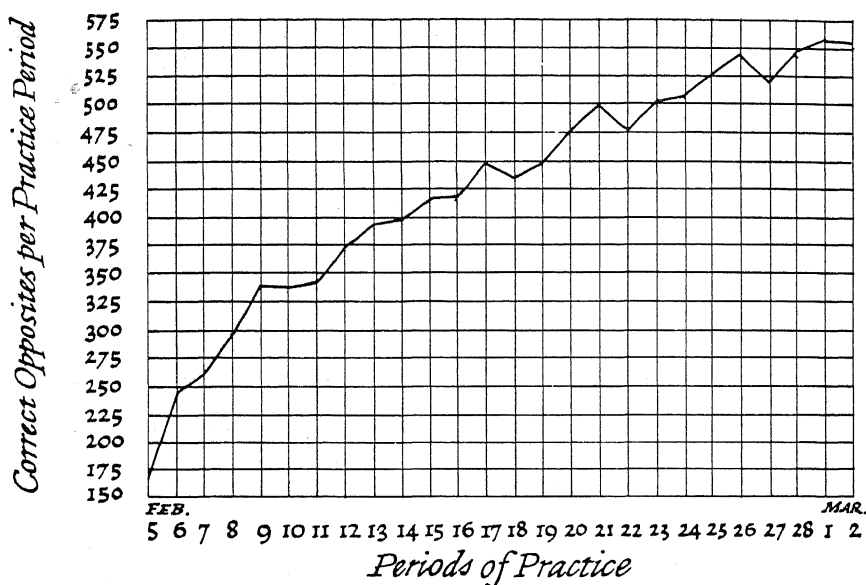



*Figure 16.3.* A Learning Curve. (From F. L. Ruch, *Psychology and Life*, Scott, Foresman and Company; adapted from Thorndike, *Adult Learning*, New York, The Macmillan Company, 1928.)

in the learning process. It may be the result of lack of motivation, inefficient methods, or, very often, ineffective teaching or poor training. However, a plateau is *not* an integral part of the learning process; hence one should not be concerned by its absence.

The numerous experiments made by psychologists and educators to determine whether accuracy or speed should be emphasized in training indicate that the initial emphasis should be on accuracy, regardless of whether the person is being trained to inspect manufactured parts, to sort dog collars for size, or to typewrite. Within a few days or weeks those who have been trained in accuracy are not only more accurate than those trained for speed but quicker as well.

The existence of individual differences is axiomatic in psychology; their range varies with ability. Since training heightens these individual differences, every effort should be made to select people who will benefit most from the training offered. Many attempts have been made to measure the degree of these individual differences. Table 16.1, adapted from Hull (*4*), shows that the ratio of 1 : 2 is common between the poorest and the best performance of individuals doing the same task.

Table 16.1. Ratio of Least Efficient to Most Efficient Individual in a Variety of Gainful Occupations

| Occupation | Criterion | Ratio of Poorest to Best Worker |
|---|---|---|
| Heel trimmers (shoes) | No. of hours per day | 1 : 1.4 |
| Loom operators (silk) | Percent of time loom is kept in operation | 1 : 1.5 |
| Hosiery maters | Hourly piecework earnings | 1 : 1.9 |
| Loom operators (fancy cotton) | Earnings | 1 : 2 |
| Knitting machine operators | Pounds of women's hose produced per hour | 1 : 2.2 |
| Elementary-school teachers | Ratings of superiors | 1 : 2.5 |
| Spoon polishers | Time per 36 spoons | 1 : 5.1 |

Learning should be regarded as a real-life process in which all the sense modalities are permitted to take part. This means learning by seeing as well as learning by feeling. Moreover, a learning process that merely allows the person to watch is not sufficient; there must be successful integration between "Now watch me" and "Now do it yourself." An individual may learn to drive an automobile by watching, but most people had better not consider themselves drivers until they have also driven a car.

### The Role of Schools and Colleges

The trend in education in recent years has been toward specialized training. The rise of business and engineering colleges in popularity, coupled with a general decrease in the proportionate enrollments in schools of liberal arts, illustrates this point. Recent developments in higher education have taken the form of junior colleges aimed at specializing for industry.

A recently organized school in New York City, which functions at the junior-college level, is known as the Fashion Institute of Technology and Design. It is supported in part by the Board of Education of New York

and in part by an educational foundation of the needle trades. The school offers college subjects but in addition gives specific training for work in any of the many divisions of the needle trades, such as gloves, underwear, suits, dresses, shirts, blouses, and millinery. Its graduates are trained in illustrating, designing, and production control, and also in the techniques of sewing and draping. A feature of this school is the coöperative education in effect in the last semester. During this semester each senior goes to school for two five-week periods and works in industry for two five-week periods. When students are in school, alternates are on the job. The school makes a real attempt to place a student in the specific industrial job for which he has been training. This coördination of job experience and classroom work gives the graduates working experience and a knowledge of a job in a factory, sample room, or other department of an industrial establishment, as well as the knowledge gained in the classroom. These students know what the pressure of production means. They see clearly the tie-up between education and job training. Since most people must eventually enter an office, factory, or profession, such real experience in addition to a more general education is of decided value. However, the "set" and "shift" of alternating classroom and work activities has its disruptive influences in the educational process. The week prior to work and the week of return to the classroom is noticeably more chaotic than the usual classroom scene.

Coöperative education has its perils. Students often do not respond too smoothly to the shifting scene—now school, now work, now school. Tensions are built up concerning the job the student hopes to get. If economic conditions are bad, he may not even get a job.

Some employers are more interested in "exploitation" than training. They are served high-caliber personnel at minimum wages. The administrators of the program are subjected to pressures from employers to send top-ranking students and from students to obtain top-ranking jobs. All students and jobs are not top ranking.

Coöperative education does have its shortcomings and limitations and in extreme instances it may interfere with the academic training process and not even provide industrial training. All this is mentioned not to discourage the development of coöperative education but rather to improve it by pointing out the potential trouble spots so that efforts may be made to avoid them.

Some industries and specific companies conduct their own training schools, not only to make sure of having acceptable applicants, but also

because they recognize the importance of this training. An outstanding example is the Ford school in Dearborn, which trains young men in automobile mechanics and related fields.

Industry generally does not recognize its responsibility for training workers. The chief reason for this is possibly the lack of facilities and of "know-how." In the past, because of an undue fear of the taint of commercialism, schools and colleges have too often refused to recognize the service they can perform. Coöperation between these two great forces in the training of workers has been conspicuous by its absence. The trend in this country is toward more and better education. Many people predict not only that the large number of students now attending colleges will continue unabated but that enrollment figures will steadily increase. The GI bill has brought a tremendous increase in job training schools, and many of these have taken on cloaks of respectability. Now is the time for both industry and educational institutions to coöperate in making training in industry more realistic and more valuable.

The International Harvester Company of Chicago and the University of Chicago afford a rare example of such coöperation—an ideal example of what can be achieved when "company funds" and "college brains" get together. The training courses offered in the Central Sales School are only part of the program. These courses are broken down into four areas: orientation, personnel development, management operation, and technical aspects of the job. The program is handled on a mass scale; 17,000 men have graduated from the school in one year. In addition, plants to train the supervisory personnel along the lines of centralized and individualized needs are being developed. Harvester's training program recognizes not only the need for employee orientation but also the value of off-hour training directed toward the employee's intellectual pursuits, recreational inclination, and personal and domestic situation. This company regards its entire training program as a social contribution to the need for better-informed adults in America. It is interested in developing individuals, not simply in training men.

The relationship between Harvester and the University of Chicago is exceedingly interesting. Since it is hoped that their coöperation will serve as a model for future collaboration between industry and the colleges, the opening paragraphs of their contract are quoted.

> The International Harvester Company is interested in developing a program of training and education which will increase the feeling of unity in the organization; develop individuals in the company for responsible positions; facilitate

the absorption of new employees and returned servicemen and women into the organization; and, in time, contribute to a better understanding of the application of machinery in agriculture. To achieve these ends, the company plans to develop the appropriate staff and physical facilities within its organization. In the development of these plans, the advice and counsel of specialists in adult education, business education, vocational education, etc., on the staff of a leading university would be welcome.

The University of Chicago through its Department of Education in the Division of Social Sciences and through its School of Business is interested in studying methods and procedures for communicating information of varying intellectual contents to individuals of varied backgrounds. The experience attained within a university and its laboratory schools is restricted both in regard to intellectual content and the heterogeneity of the individuals with whom it comes in contact. For these reasons the University welcomes the opportunity to cooperate in the formulation of objectives, development of instructional methods, and the measurement of the achievement of the objectives made possible by the educational plan of a large industrial organization.

It is therefore proposed that the International Harvester Company and the University of Chicago enter into a working relationship to achieve their mutual ends.

The role of this university in training instructors for the Harvester Company shows that college professors can improve instruction for industrial training, that trained instructors should devote their attention to what the students are learning rather than concentrate on lecture organization. The company instructors are taught to define objectives not in terms of content but in terms of the students' changes in behavior. They are also taught to eliminate nonessential material from classroom courses.

### Typical Training Departments in Action

The average worker insists that he was never trained for his job, regardless of whether he has worked for small or large organizations. By and large this is true. Business organizations must recognize their responsibility and create training departments on a larger scale than has been done in the past.

The training responsibilities of an industrial or business organization are clear cut and its training program can be considered as having two functions. The first, a general orientation in company policies, routines, and rules, should attempt to assimilate the new employee as rapidly as possible so that he may overcome his feeling of being a stranger. The second function concerns the specific job training. The training programs of companies, large and small, generally are weak in both these aspects.

The writer is reminded of the time he was hired as a factory operative in a large manufacturing concern. After a series of interviews and a physical examination he was assigned a number, given a time card, and sent to a specific department. After showing his credentials to the department supervisor, he was seated at a work bench and told, "This is Joe. He will tell you what to do." Joe, who seemed rather annoyed, said merely, "The best way to learn is to help me do this." At the end of the day the supervisor came over and asked for the new man's production. Obviously there was none because he had been helping the man who was supposedly training him. Rather than say this and get into trouble with Joe, the writer said that he had not produced anything because he thought he wasn't supposed to work the first day. The supervisor looked at him in a manner that he clearly understood—it suggested that he was pretty dumb—and said, "Be sure that you produce tomorrow." The next day he went to work, asking as few questions as he could and without annoying Joe. Of course, his production would have been greater if he had had at least an hour's demonstration and training. Some time later he discovered that Joe disregarded him, not for personal reasons, but simply because he himself had to produce his usual amount of work and was given no allowance for the time spent in training a new man.

At another time the author was hired as a salesman in a large department store. For three mornings he listened to instructions and practiced writing out all the parts of weird sales slips covering transactions which rarely, if ever, occurred in a normal day—and when they did occur, no one would have known how to handle them, with the possible exception of the section manager. The author was given none of the necessary information about the merchandise he was to sell, because the people who were going to sell underwear were being trained at the same time as the people who were going to sell ties or any of the many other items which make up the inventory of a large department store. After the training program was completed, he was put to work selling on the main floor. But he had an empty feeling in his stomach; he was in conflict. He had passed the training examination with flying colors but knew nothing about selling men's underwear—nothing about the different sizes and how to measure them, nothing about the various materials, and nothing about the stock. He could make out all varieties of "await orders," but nobody wanted those. The customers wanted to buy underwear.

In some smaller organizations, after the employee is hired and put to work, he is told to ask any questions he wants to; but since it is never

made clear who is supposed to answer these questions, the average worker gains experience by struggling along meekly on a hit-or-miss basis. Industry can and should do a better job. It is not necessary for an organization to make a fetish of training; but hiring an experienced educator or psychologist on a consulting basis for one hour a week over a short period, such as a month or two, will often enable it to set up a training program that is infinitely better than the one it does not have at present.

The Electric Auto-Lite Company emphasizes visual aids in its training program. In fact, Walt Disney's first industrial production was made for this company. The film, which runs 18 minutes and cost about $75,000, is designed to teach the correct installation of spark plugs; to date, over 200,000 people have seen it. The company is proud of its Library of Congress award for producing one of the outstanding training films of 1945.

General Motors has a gigantic training program covering many areas. The training in the field of management and supervision includes many different specialized programs. The company has a large apprentice training program and does considerable "on-the-job" training. It also conducts an institute featuring coöperative education. The courses offered vary from special classes of a few days' duration to a four-year course, which, together with certain prescribed postgraduate work in the fifth year, leads to an engineering degree.

### The Training Staff

Training in industry is given most frequently by an experienced operator. The supervisor and the special instructor follow in that order. Oddly enough, there is often an inverse relationship between this order and effectiveness in training. There is absolutely no reason for assuming that an experienced operator is a good teacher; such an operator is often not capable of even describing the method he uses. People who are excellent ice skaters often cannot teach anyone else to skate; the same applies to expert tennis players, carpenters, electricians, etc. It is necessary to train the experienced operator in training techniques before he can be considered an effective trainer. What applies to the experienced operator also applies to the supervisor. Although it is true that the supervisor may know how to handle people, he may not know how to do the specific task in question. The best method of training in industry is to have a special instructor who can adequately do the job and who knows how to teach as well; the latter is essential. Very frequently this means training the trainer.

Alex Bavelas, of the Industrial Relations Section of the Massachusetts

Institute of Technology, has clearly demonstrated this point. He has conducted a number of studies which indicate that the training of trainers results in better performance by the people being trained. He suggests that trainers be given training through discussion methods, so that they will better understand the implications of attitude and motivation in a training program. In one study he devoted eight hours to such a course; the results indicate that differences in employee ability exist when performance is measured under three conditions: without training of the trainers, with four hours of training, and with the full eight-hour course.

The fact that experienced operators are not necessarily good trainers is seen clearly in the familiar situation wherein an experienced automobile driver attempts to teach his wife the intricacies of driving. Within half an hour he has usually lost his temper and has told her that she will never learn to drive, and she is tearfully vowing that she will never ask him to teach her another thing; it is pretty certain that she will not get into the car again. But within a day or two this blows over and a second lesson is attempted. This ends the same way, except that now they both insist that she go to school to learn how to drive. Whether with an official instructor or a neighbor, she will, given a considerable amount of "patience and fortitude," finally learn.

## Evaluation of Training

It is not enough to merely recommend desirable training procedures and describe some of those in operation. It is necessary for the industrial psychologist to conduct research in this field as well as in the others that occupy his interest. The essential difference between a scientific and a nonscientific training program is that the former requires objective evaluation. Research methods must be used to finally determine the relative merits of training methods, aids, and results.

Mahler and Monroe (7) attempted to gain some information in connection with four rather important and basic questions related to industrial training. These questions were:

1. How are training needs determined?
2. What are the relative merits of different training methods?
3. What are the relative merits of different training aids?
4. What has training accomplished?

In an attempt to answer these questions they used three sources of information—a review of the literature, a questionnaire survey which

brought responses from 150 companies out of a total of 253 selected companies solicited, and field visits to 30 selected companies. The results of the study, while interesting in terms of the reported case histories, are necessarily disappointing to the student of training research. They report that training research tends to be minimum in quantity and elementary in nature. More optimistically they report a trend toward more and better training research, noting that some of the companies doing rather impressive jobs just never manage to report their results in the literature where it would be accessible to those interested in the problems of training research. Not more than one company in 40 actually studied the relative merits of various training methods or aids. Training effectiveness was usually evaluated by subjective judgment rather than by research methods. Practically no attempts were made to show that the alleged improvements could be attributed to the training rather than to other causes.

Before we can be certain that our industrial techniques lead to positive results rather than wishful thinking we must be able to obtain a measure of the training accomplishment. In other words, criteria are needed.

The criteria suggested by Lindahl (*6*) for checking the results of training are:

1. Better quality of production.
2. Increase in the number of operators able to meet job standards.
3. Reduction in time required to do a specific job.
4. Decrease in breakable supplies or tools.
5. Decrease in absenteeism.
6. Reduction in separation rate.
7. Reduction in operational costs.
8. Better performance on personnel tools such as tests, rating scales, and attitude surveys.

McGehee has been conducting rather valuable work in the area of training. Two of his studies are refreshing because of their practical concern for real problems. In one study (*9*) he established that fast and slow learners could be differentiated as early as the second week of training. By the end of the second week predictions could be made differentiating the two groups with a 20 percent better than chance accuracy. By the end of the sixth week, the advantage over chance is 63 percent.

In another study (*10*) a 61.6 percent reduction in waste was effected as a result of a realistic awareness of training and its concomitant problems. McGehee recommends that management present frankly, fully, and

sincerely the reasons for any change to all who are affected by it, then enlist the participation of the individuals involved by assigning specific tasks at their level of competence. In addition, such individuals must be informed of results and given recognition for assisting in the program.

McGehee's idea is that one explains the need for change, secures participation, and keeps participants informed. Group decision is omitted from McGehee's requirements and this view is in contradiction to those who believe that group decision on goals is a most important part of the training. David, who has worked at Harwood Manufacturing Co., Prudential, and with McNicol Pottery, has had some initimate experiences along this line. He believes that group decisions may not be as important as the sponsors of this view hold.

An analysis of the conflicting hypotheses and some of the data leads to the theory that, if the trainees can accept management's need and if the problem is sincere and not subterfuge, then group decision may not be necessary at all. Group decision can even be a subterfuge or "gimmick," in which case it will surely boomerang like any of the other tricks that will work for only a short time.

Incidentally, McGehee and Livingstone (*11*), in a follow-up of the study in which waste was cut by 61.6 percent, found that with no reinforcement of training the reduced waste rate continued for 80 weeks, which while not evidence of permanence is at least evidence of a continued effect over a reasonably long period.

## Summary

Training develops and improves skills necessary for job performance. Industry generally tends to shirk its responsibility for training workers, preferring to handle the problem by hiring experienced employees. Experience and training are not incompatible methods of learning but are two aspects of the same process.

Application of principles of learning can enhance the value of a training course. Ten principles were enumerated in this chapter. Schools and colleges can be of considerable help to industry in training applicants for jobs; more coöperation between education and industry is desirable. Coöperative education shows considerable promise in the integration which can be achieved but it has its limitations. Generally speaking, in larger organizations training departments are inefficient; in the smaller organizations they are nonexistent. Both large and small concerns can benefit from assuming training responsibilities. Finally, it is important to recog-

nize that an intelligent worker or supervisor is not necessarily a good trainer, but he may be made one after being trained along this line.

A few companies have recognized the importance of training and education in industry and have formulated very successful programs. The problem of effective training programs can best be solved by industry and the colleges working together, each contributing what it is best fitted to contribute to the success of a continuing plan. The value of training must not be surmised; its effects should be checked against changes in certain criteria of performance. Research on the value of training programs has been minimum in quantity and elementary in nature.

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# CHAPTER 17 • Accidents

**ACCIDENTS** are not funny, despite any individual reaction to what happened to Mr. Jones. In 1953, 95,000 people were killed, 9,600,000 were injured, and the cost amounted to $9,100,000,000 (*21*). The automobile was the number one accident killer and traffic deaths totaled 38,300. Deaths at work totaled 15,000.

Accidents not only are costly to our industrial economy but they result in anguish, pain, and often death to the unfortunate individuals involved. Sometimes accidents are attributed to physical causes in the environment and sometimes they are considered to be caused by any of a number of items related to the human factor. The tendency has been to minimize the role of "luck" in accidents and to look for a specific cause. The chart in Figure 17.2, which was prepared by the Metropolitan Life Insurance Company, lists the major causes of in-

**Bowled Over As He Misses Cue Again**

Wheeling, W. Va. Feb. 4 (AP)—Walter Jones has discovered that sports—even pool and bowling—can be dangerous.

Two months ago while trying a difficult pool shot his cue broke and the splintered end cut his hand.

Last Sunday Jones became excited when a member of his bowling team missed a triple-header strike by one pin. He grabbed hold of a wall coat hanger, somehow got entangled and pulled the hanger loose. He fell and broke a wrist.

"I guess I'm just too exuberant," Jones said. "I'd better learn to calm down."

*Figure 17.1.* Bowled Over as He Misses Again. The name of the individual in this anecdote has been changed to protect the privacy of the person who actually figured in the incident. (From the New York *Post,* February 4, 1954. By permission of Associated Press.)

dustrial accidents. However, this chart deals merely with the physical aspect of accidents and does not take into consideration the psychological factors at work in the individual at the time of the accident. The human factor as a contributing cause of accidents is emphasized in Figure 17.3, which shows the primary causes of accidents among the employees of

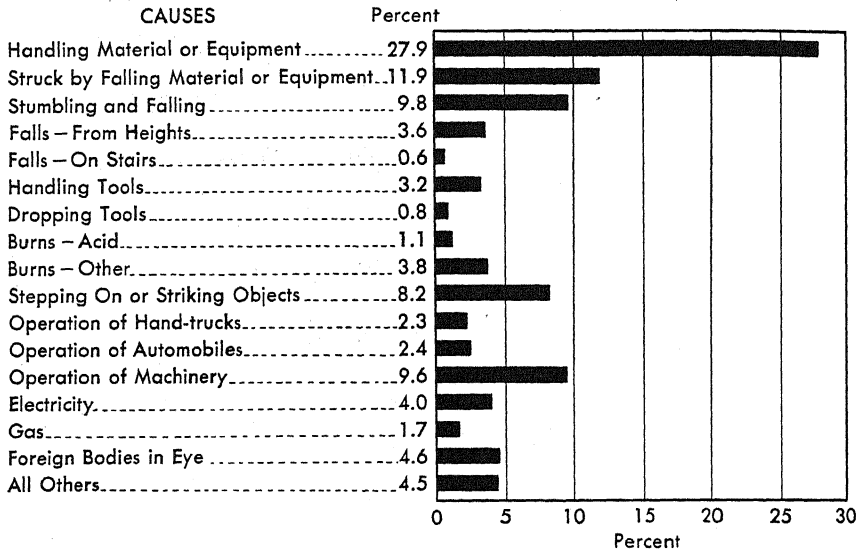



*Figure 17.2.* Causes of Accidents. (Courtesy of the Metropolitan Life Insurance Company.)

the Cleveland Railway Company; this study was done in coöperation with the Metropolitan Life Insurance Company.

This particular study (*1*), similar to many of those which preceded it, brings out some of the personal factors involved in accidents.

> Analysis of the accident records led to the discovery that a relatively small group of motormen were involved in a large percentage of all accidents reported, although operating under practically identical conditions as the other larger groups of trainmen whose accident records were, in most cases, excellent. This finding apparently confirmed statements of psychologists and psychiatrists that accidents do not distribute themselves by chance but that they happen frequently to some men and infrequently to others as a logical result of a combination of circumstances. Those individuals who because of certain mental, psychological or physical defects fail to control a situation leading to an accident when it arises, usually become involved, while those possessing the necessary physical and mental requirements show little susceptibility to accident.

These findings led to the belief that the incidence of accidents was an individual problem and that accidents could be reduced by studying the individuals who had them and removing the causes.

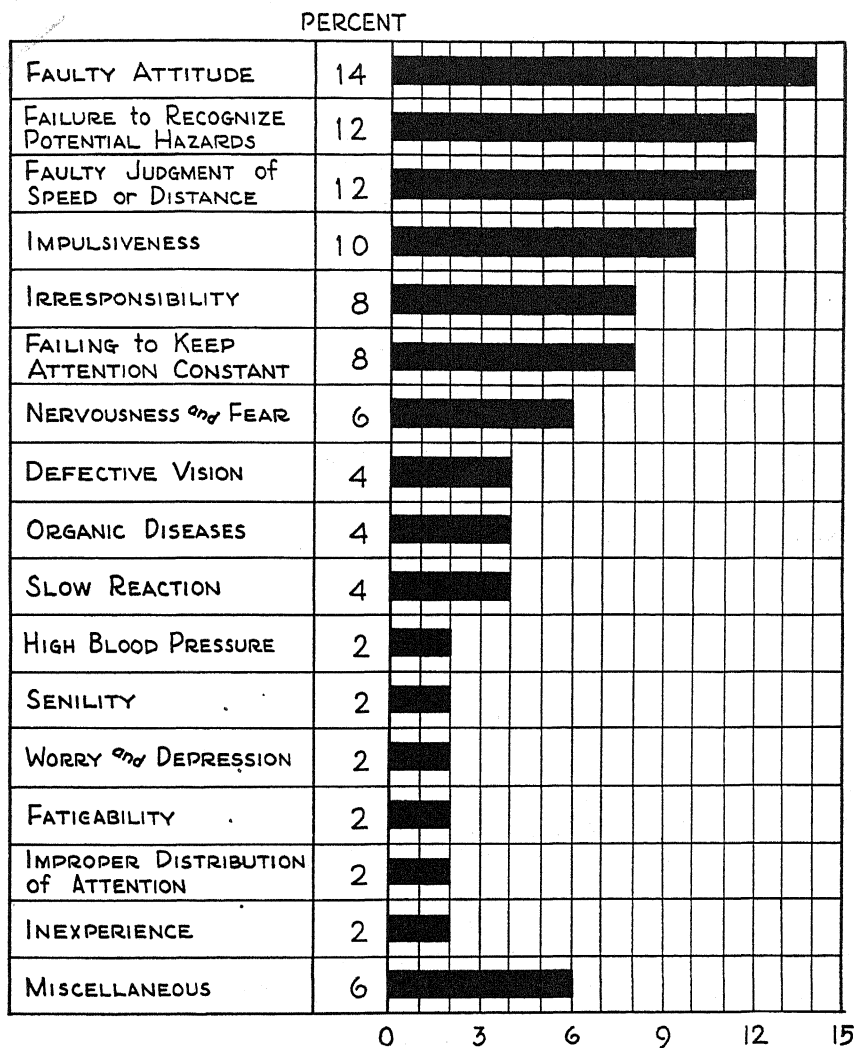



*Figure 17.3.* Primary Causes of Accidents. (Courtesy of the Metropolitan Life Insurance Company.)

The treatment of people who were likely to have accidents was divided into three main categories: medical assistance, personality readjustment, and operating defects.

MEDICAL ASSISTANCE

Physical difficulties were found to be of primary importance in 12 percent of the cases. Defective vision, high blood pressure, and chronic appendicitis are examples of the type of disability which, when corrected, result in reduced accident rates.

PERSONALITY READJUSTMENT

Faulty attitude, irresponsibility, and other personality problems were involved in 22 percent of the cases. Although the railway company handled the "therapy" in a rather crude manner, successful changes in the individual employees were reported. The company had the superintendent talk to the employee and give him "a clear understanding of his personality difficulties and . . . point out to him frankly why they interfered with satisfactory performance on the platform and what the probable outcome of them would be unless a change in general outlook and behavior on the job were shown." Most of these men were placed on probation.

OPERATING DEFECTS

The remaining 66 percent of the cases were due to poor job performance, i.e., failure to recognize potential hazards, faulty judgment of speed and distance, and lack of attention. These shortcomings were overcome by retraining the men.

The results of this study were gratifying to the railway company. Thirty-three (or 75 percent) of the men disappeared from the "accident-prone" group because their rate fell below the one accident per 1000 car-miles operated. The accident rate for the entire group dropped from 1.31 accidents per 1000 car-miles to 0.75, a decrease of 43 percent.

### Accident Proneness Principle

With slight modification the statement "Accidents do not distribute themselves by chance but . . . happen frequently to some men and infrequently to others as a logical result of a combination of circumstances" has become a generalization. This statement embodies the principle of accident proneness.

Mintz and Blum, who have critically evaluated the literature in the field, have come to the conclusion that accident proneness is overrated (*18*). A correct interpretation demands that the second half of the statement be worded as follows: Accidents happen frequently to some men, i.e., *some men have more accidents than would be expected by chance,*

and infrequently to others, i.e., *more men have few or no accidents than would be expected by chance.*

In accordance with chance expectancy some men will have no accidents, some will have one accident, some two accidents, and some three or more accidents. In other words, chance will result in a distribution of accidents and it is wrong to assume that in accordance with chance expectancy all men should have equal numbers of accidents.

To establish or support the principle of accident proneness, three methods can be used. In one method, the distribution of the total number of accidents in a population is compared with the distribution that would be expected if only chance factors operated. A comparison of these two distributions makes it possible to determine whether accidents happened more frequently to some men than would be expected by chance. The second method is to study the individuals and the number of accidents they have in two successive periods. A tendency for these people to have similar numbers of accidents can be regarded as evidence in favor of accident proneness. The third method is to compute the correlation coefficient of the accident records of a group for two periods.

Mintz and Blum (*19*) found a considerable amount of careless reporting, illogical reasoning, and unfamiliarity with the statistical theory underlying accident proneness. Their analysis shows that 60 to 80 percent of the accidents reported appear to be attributable to unpredictable factors and the remaining 20 to 40 percent to the component of accident liability which includes both personal characteristics and environmental conditions contributing to accident records. Thus accident proneness does not seem to be the major factor in understanding or attacking the problem of accidents.

The most frequently offered evidence for the existence of accident proneness is the fact that a small percentage of the population has a large percentage of the total number of accidents. Such statements, by themselves, do not substantiate accident proneness; the obvious error in them is made clear by the following hypothetical situation: Two hundred employees have 100 accidents. If every employee who has one accident has only one, there will be the opportunity for only 100 employees to have an accident record and yet this leads to the conclusion that 50 percent of the employees have 100 percent of the accidents. This situation is extremely unreal, for there is no reason to believe that each employee should have one accident. According to chance,[1] approximately 121 in a population of

[1] These data have been computed by A. Mintz by means of the Poisson distribution or "law of small numbers."

200 should have no accidents, 61 people should have one accident, 15 people should have two, and three people should have three accidents. On this basis, the expectancy is that 9 percent of the population will have 39 percent of the accidents and that 39.5 percent of the population will have 100 percent of the accidents. This distribution is due solely to chance expectancy; there is no evidence of accident proneness.

If a deck of cards is dealt to four people it sometimes happens that one of them will get six, seven, or more hearts instead of three or four. Such a distribution is normally attributed to chance.

Statements to the effect that 10 percent of a population have 30 percent of the accidents or that 25 percent have 75 percent of them must be regarded as inconclusive unless the total population and the total number of accidents are known. Only when we have these figures can we establish the extent to which the distribution of accidents is due to chance expectancy and the extent to which other factors such as accident proneness enter.

An early study which is often referred to and which finds evidence for accident proneness was conducted by Greenwood and Woods (*10*). The data in this study are rather complete, which is more than can be said about many of the more recent studies. These authors develop the statistical formula based upon a theory of accident proneness and this must be recognized as a contribution. Table 17.1 presents some of the data from this study.

Table 17.1. Accident Distribution

| Group | Total Population | Total Number of Accidents | % of People Having No Accident | % of People Having No Accident on Chance Expectancy |
|---|---|---|---|---|
| 1. | 750 | 432 | 53 | 56 |
| 2. | 580 | 278 | 61 | 62 |
| 3. | 648 | 303 | 68 | 62 |
| 4. | 584 | 253 | 73 | 70 |
| 5. | 414 | 200 | 71 | 61 |

If the principle of accident proneness is to be upheld, more people should have no accidents than would be predicted by chance. In three of the five groups this holds true but in the other two it does not. In the three groups where it does hold true, the percentages are 6, 3, and 10 percent. These percentages are to be attributed to accident proneness in certain people but they must also be attributed to such other causative

factors as length of employment, job hazard, training, etc. In any event, accident proneness as a cause for accidents is apparently not as formidable as some authorities have made it. Although Greenwood and Woods do establish the principle of accident proneness they do not indicate the degree to which it is responsible for accidents; many others who have done research in this field imply that the extent of accident proneness has been exaggerated.

Another erroneous use of accident proneness is seen in the arbitrary classification of people who have more than the average number of accidents as accident prone. Such a method was used in the Cleveland Railway study, and at least one textbook defines accident proneness as being present in people who have two or three times as many accidents as the average person has. In Table 17.1, the average number of accidents per person is approximately 0.5; hence in an arbitrary classification a person having one or two accidents would be accident-prone. This is not necessarily true. The hypothetical situation previously mentioned shows clearly that some people may have two or three accidents solely on the basis of chance expectancy. This critical attitude toward the concept of accident proneness is in part supported by articles by Cobb (*4*) and Johnson (*13*). More work along these lines should be encouraged.

Arbous and Kerrich have also made an exhaustive search of the literature on the topic of accident statistics and accident proneness (*2*). Like Mintz and Blum, they feel that the knowledge of this concept has hardly proceeded further than the early studies of Greenwood and in some respects the topic has actually suffered a reverse because of the misunderstanding. Their article is an exceedingly well-written and readily understandable one and should be a standard reference for the more serious student in this area. They raise such important points as the correlation between minor accidents for two successive periods, the correlation between major accidents for two successive periods, the correlation between minor and major accidents, and the correlation between different types of accidents. They conclude with the comment: "'Accident-proneness Percy' is a figment of the imagination resulting from wishful thinking." This points to a view of accident prevention since it means that an individual's liability or proneness to accidents (when such a thing exists) in one set of circumstances will give little indication of proneness in another. The cogent remark that might best summarize the point of view of Arbous and Kerrich is as follows: "This does not mean that accident proneness does not exist, but that so far we have not succeeded in defining it, assessing its

dimensions and constituent elements, nor evolved a technique for putting it to practical use."

Possibly one of the greatest sources of limitation in studying accidents is the accuracy, or rather the lack of it, in the reporting of accidents. Anyone who has done any work at all in industry knows that many variables enter into the decision to record the accident. Fear of punishment or the likelihood of gaining an insurance claim very often distort accident records in either direction or both directions. Researchers should seriously study the manner of ascertaining an accident and its recording before accepting the data on face value and using statistics to explain what may not exist in the first place. This simply means that some accidents are not recorded and others are. Somehow this should be known to the researcher before he embarks on a theory to explain the phenomenon.

Accident proneness as a means of understanding the occurrence of accidents is useful provided that we recognize clearly that the human factor and the physical environment may contribute to accidents in the absence of accident proneness.

Drake (7) has proposed an interesting theory to explain the influence of accident proneness. According to him, "Where the perception level is equal to, or higher than the motor level the employee is relatively a safe worker. But where the perception level is lower than the motor level, the employee is accident prone and his accident proneness becomes greater as this difference increases."

Drake demonstrated the feasibility of this theory in a study made on a group of factory workers. He gave them three motor or manipulative tests and two tests of visual inspection and sorting. The raw scores were converted into percentiles and the difference in motor level as compared with perception level was obtained. The study showed that employees who were faster on the motor tests than on the perception tests had more accidents and, conversely, that those who were faster on the perception tests than on the motor tests had fewer accidents. Drake reports that selecting new employees for comparable tasks on the basis of performance on these tests reduced accidents 70 percent. He believes that this theory is applicable to all types of accidents including automobile accidents. Although the present author does not know of any check on these claims, he regards them as interesting. However, an obvious limitation of this theory is the lack of consideration given to the individual's personality and to contributing emotional factors.

A slightly different approach to the problem of accidents has been

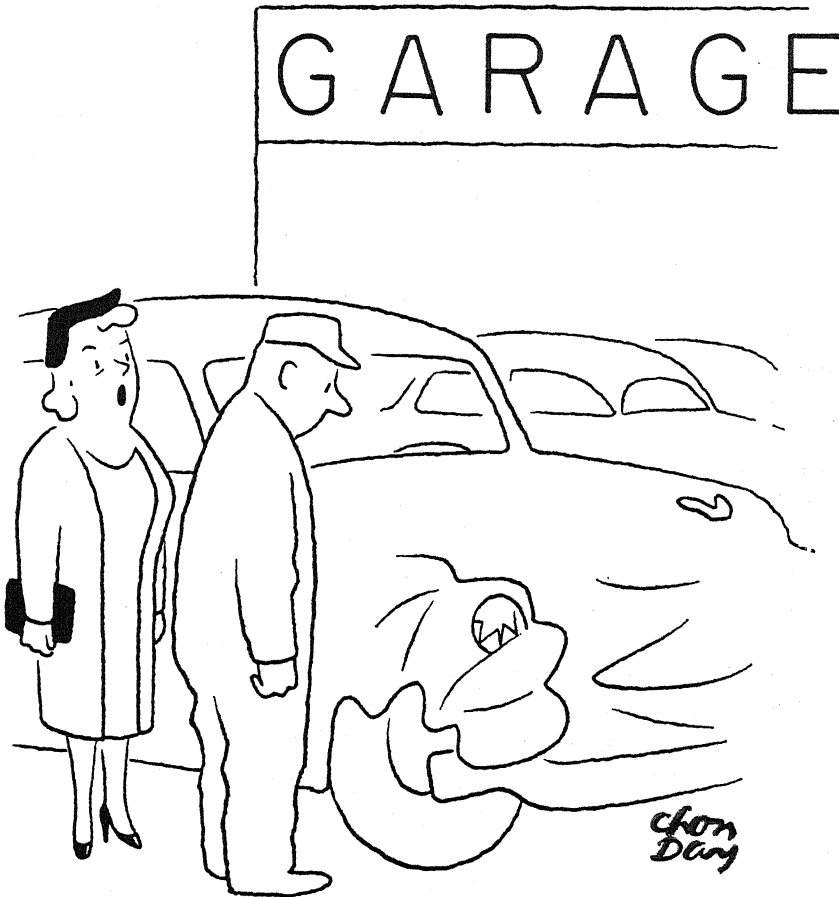
proposed by Kerr (*14*). Provided one does not take seriously the concept of accident proneness as applied to factory departments, the work of Kerr is worthy of consideration. He found that accidents occur with

"There must be SOMETHING wrong with it. It keeps hitting things."

*Figure 17.4.* (From "The Passing Scene." *The Travelers 1954 Book of Street and Highway Accident Data,* Travelers Insurance Companies, Hartford.)

greatest frequency in those factory departments with low intracompany transfer mobility, low promotion probability, and high noise level. Accident severity was found in departments with such characteristics as predominance of males rather than females, low promotion probability,

low suggestion record, non-youthfulness of employees, and high average tenure of workers.

The tendency for departments lowest in promotion probability to be high in both severity and frequency of accidents may be related to indifference to the work environment and may contribute to accidents, according to Kerr. The correlation between accident frequency and severity was +.64. This fact points to the need to know which record is considered the criterion. Many studies merely accept the criterion that is most readily available and then go on to prove or disprove a point—which may be impossible to prove or disprove. An exaggeration of this is offered by the cartoon presented in Figure 17.4.

### Accident Reduction

Raising a question as to the importance of accident proneness does not mean that we should take the fatalistic attitude that little can be done to reduce the number of accidents caused by the human factor. Nothing could be farther from the truth. The fact that accident distribution is in part determined by chance means that many unrelated factors are operating, not that accidents do not have causes; it means that there are multiple causes and all of them must be considered. The principle of accident proneness merely gets at one of the causes, i.e., the human factor in individuals who are accident prone. The human factor must also be considered in accidents to individuals who are not necessarily accident prone. The environment, the physical factors of machine design and wear, and innumerable other factors must also be included. Recognizing that there are many elements which contribute to an accident and considering differences in accident proneness as a minor rather than a major one will make it possible to accomplish more in reducing accidents. Even a person who is accident prone can cut his accident record by attacking the other factors which contribute to his accidents. Many people who are not accident prone may have one or more accidents. These people too can reduce their accidents by altering the physical conditions conducive to them. For example, accidents are reduced by the installing of safety islands on heavily traveled roads and the provision of safety guards on moving machinery.

There are two approaches to accident reduction as related to the human factor. The first is usually referred to as the clinical method and the second involves educational campaigns that appeal to groups.

A good example of the clinical method is the tremendous amount of

work De Silva has done in the field of automobile accidents; his book *Why We Have Automobile Accidents* is a scholarly presentation and positive attack on the problem (5). De Silva believes that the safe and efficient flow of motor transportation depends primarily on the individual behind the wheel and that there is a crying need for constructive supervision of the driver. He proposes four factors to be considered in determining a driver's susceptibility to accidents: (1) "exposure," or the number and relative danger of the hazards encountered; (2) speed of driving; (3) skill in handling the vehicle; and (4) safety-mindedness.

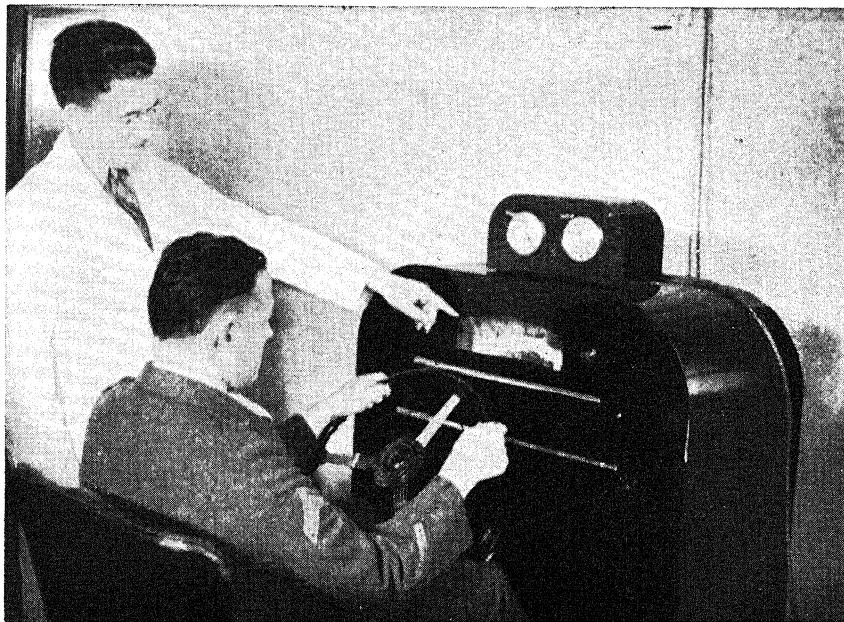



*Figure 17.5.* Moving Road Scene Driver Test Apparatus. (From *Fatigue and Hours of Service of Interstate Truck Drivers,* Public Health Bulletin No. 265, Federal Security Agency, U.S. Public Health Service, Washington, Government Printing Office, 1941.)

Exposure factors which contribute to accidents are night driving, week-end and winter driving, and driving during rush hours and in metropolitan areas. The human factor—i.e., age, sex, occupation, and experience—also constitutes an exposure factor. De Silva believes that the "high-exposure" driver should not be allowed to use the highways unless he can drive better than the average driver. How this could be enforced is

difficult to see; possibly retraining the "poorer-than-average" driver would in part remedy the situation.

Speed is a factor in accidents. De Silva reports that a group of drivers traveling over 50 miles an hour had 50 percent more accidents recorded against them than a group driving at a moderate rate of speed (35 to 45 miles per hour). Speed affects maneuverability of the car and the distance traveled before stopping. Whereas at a rate of 20 miles per hour the average driver travels 22 feet while reacting to a stimulus indicating danger on the road, this distance is increased to 66 feet if he is driving at a rate of 60 miles per hour. (See Fig. 17.9, p. 471.)

Skill in driving can be determined by road tests which measure the individual's experience and by apparatus tests which measure his driving aptitude. Apparatus tests can measure responses to complex or dangerous situations. The moving-road-scene (Fig. 17.5) is useful in measuring general motor aptitude; the driver's coördination, speed of reaction, and ability to carry on several activities at once are measured under simulated driving conditions.

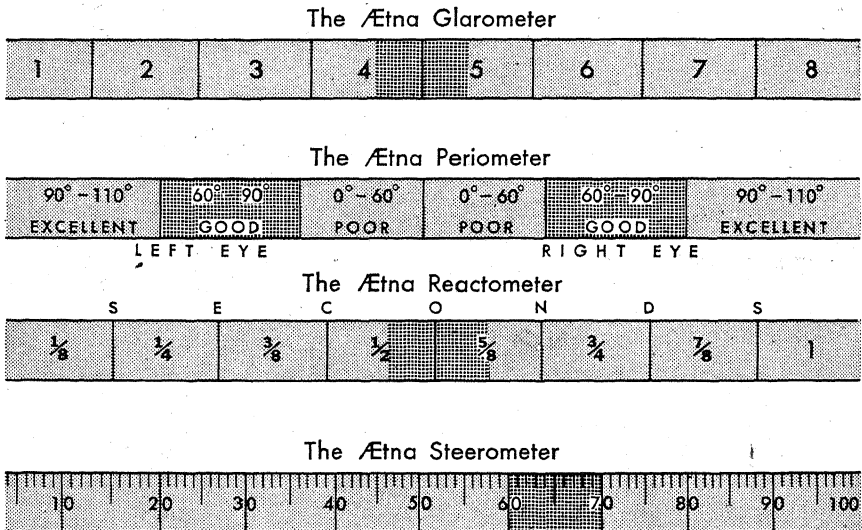



*Figure 17.6.* Driver Reaction Score Card. (Tests used by the Aetna Life Affiliated Companies at the New York World's Fair in 1939.)

Other apparatus tests measure sensory abilities. The glarometer and the perimeter concern vision. The reactometer measures reaction time and the steerometer measures eye-hand coördination. (See Fig. 17.6.)

Table 17.2. Motor Vehicle Violations Recorded for Driver Sample (17)

| | Number of Drivers | |
|---|---|---|
| | Accident Free N = 59 | Accident Repeater N = 88 |
| *Minor Offense* | | |
| Leaving vehicle running and unattended | 1 | 1 |
| Driving within 8′ of streetcar stopped for passengers | 7 | 20 |
| Not reasonably right for vehicle coming opposite direction | 4 | 15 |
| Not keeping right half of road when view obstructed | 2 | 5 |
| Crossing throughway without stopping | 7 | 16 |
| Failure to obey traffic signal | 1 | 11 |
| Speeding | 24 | 50 |
| Left of streetcar | 0 | 2 |
| Violation of traffic rules | 6 | 8 |
| Mechanical defect | 0 | 1 |
| Without proper lights | 1 | 5 |
| Without proper brakes | 0 | 2 |
| Without proper muffler | 0 | 1 |
| No vehicle inspection sticker | 4 | 19 |
| Improper operation | 5 | 7 |
| Negligent collision | 3 | 5 |
| *Serious Offense* | | |
| Operating under influence of liquor | 8 | 13 |
| Operating so as to endanger lives and safety | 8 | 15 |
| Going away after injury to property | 1 | 7 |
| Going away after injury to persons | 0 | 1 |
| Operating after license suspension | 0 | 7 |
| Operating without proper registration | 0 | 10 |
| Operating without being properly licensed | 4 | 9 |
| Executive Order #35 (wartime speed) | 3 | 2 |
| Violation of compulsory insurance law | 0 | 6 |
| Operating without authority | 0 | 4 |

Safety-mindedness, according to De Silva, is a complex state of mind involving recognition of driving hazards and their relation to the lives of those on the road. The basic constituents of safety-mindedness are caution and consideration for the lives and property of others. Contributory characteristics are foresight, emotional stability, mental balance, and a desire to understand one's limitations as a driver with a view to surmounting them.

Automobile accidents can be reduced if drivers who are involved in more than one accident are required to take a traffic safety course which will acquaint them with any sensory or other defects they may have, teach them about road hazards, and inform them of any defects in their cars. A

Table 17.3. Actions of Drivers Resulting in Deaths and Injuries, 1954

| Violations | Persons Killed | Percent | Persons Injured | Percent |
|---|---|---|---|---|
| Exceeding speed limit | 12,380 | 45.7 | 659,000 | 43.1 |
| On wrong side of road | 4,970 | 18.3 | 131,480 | 8.6 |
| Did not have right-of-way | 3,060 | 11.3 | 351,670 | 23.0 |
| Cutting in | 100 | .4 | 45,880 | 3.0 |
| Passing on curve or hill | 140 | .5 | 3,060 | .2 |
| Passing on wrong side | 320 | 1.2 | 32,100 | 2.1 |
| Failed to signal and improper signaling | 410 | 1.5 | 58,100 | 3.8 |
| Car ran away—no driver | 30 | .1 | 3,060 | .2 |
| Drove off roadway | 1,980 | 7.3 | 79,510 | 5.2 |
| Reckless driving | 3,440 | 12.7 | 142,200 | 9.3 |
| Miscellaneous | 270 | 1.0 | 22,940 | 1.5 |
| Total | 27,100 | 100.0 | 1,529,000 | 100.0 |

sterner attitude toward minor and more serious motor vehicle violations may help to save lives. McFarland and Moseley (*17*) report the data presented in Table 17.2. It is clear that accident repeaters commit many more violations than accident-free drivers do. The number of violations of accident repeaters is much greater than proportional expectations. McFarland is inclined to believe that a man drives as he lives. Speed in

Table 17.4. Actions of Pedestrians Resulting in Deaths and Injuries, 1954

| Violations | Pedestrians Killed | Percent | Pedestrians Injured | Percent |
|---|---|---|---|---|
| Crossing at intersection: | | | | |
| With signal | 280 | 3.6 | 17,730 | 7.8 |
| Against signal | 530 | 6.9 | 18,640 | 8.2 |
| No signal | 960 | 12.5 | 21,600 | 9.5 |
| Diagonally | 100 | 1.3 | 3,410 | 1.5 |
| Crossing between intersections | 2,910 | 37.8 | 58,880 | 25.9 |
| Standing on safety isle | | | 230 | .1 |
| Getting on or off other vehicle | 60 | .8 | 6,370 | 2.8 |
| Children playing in street | 480 | 6.2 | 21,370 | 9.4 |
| At work in road | 280 | 3.6 | 6,370 | 2.8 |
| Riding or hitching on vehicle | 60 | .8 | 2,050 | .9 |
| Coming from behind parked car | 770 | 10.0 | 50,020 | 22.0 |
| Walking on rural highway | 800 | 10.4 | 5,460 | 2.4 |
| Not on roadway | 340 | 4.4 | 10,920 | 4.8 |
| Miscellaneous | 130 | 1.7 | 4,310 | 1.9 |
| Total | 7,700 | 100.0 | 227,360 | 100.0 |

Table 17.5. Weather Conditions Prevailing in Accidents, 1954

| Weather Conditions | Fatal Accidents | Percent | Nonfatal Accidents | Percent |
|---|---|---|---|---|
| Clear | 25,930 | 84.2 | 1,021,360 | 80.0 |
| Fog | 370 | 1.2 | 12,770 | 1.0 |
| Rain | 3,640 | 11.8 | 183,840 | 14.4 |
| Snow | 860 | 2.8 | 58,730 | 4.6 |
| Total | 30,800 | 100.0 | 1,276,700 | 100.0 |

private driving and violations which reflect attitude toward authority seem to be characteristic of repeaters.

Table 17.6. Sex of Drivers in Accidents, 1954

| Sex | Drivers in Fatal Accidents | Percent | Drivers in Nonfatal Accidents | Percent |
|---|---|---|---|---|
| Male | 38,760 | 91.2 | 1,794,100 | 87.5 |
| Female | 3,740 | 8.8 | 256,300 | 12.5 |
| Total | 42,500 | 100.0 | 2,050,400 | 100.0 |

For years the Travelers Insurance Companies of Hartford, Connecticut, have been publishing booklets on auto accidents which should be dis-

Table 17.7. Condition of Vehicles Involved in Fatal and Nonfatal Accidents, 1954

| | Vehicles in Fatal Accidents | Percent | Vehicles in Nonfatal Accidents | Percent |
|---|---|---|---|---|
| In apparently good condition | 40,640 | 95.3 | 2,025,300 | 96.7 |
| Brake defective | 510 | 1.2 | 33,500 | 1.6 |
| Steering defective | 130 | .3 | 6,300 | .3 |
| 1 or 2 lights out | 260 | .6 | 4,200 | .2 |
| Tail-light out or obscured | 40 | .1 | 2,100 | .1 |
| Other defects in equipment | 600 | 1.4 | 16,800 | .8 |
| Puncture or blowout | 470 | 1.1 | 6,300 | .3 |
| Total | 42,650 | 100.0 | 2,094,500 | 100.0 |

tributed to every driver and pedestrian. Among the dynamic titles chosen for these booklets are the following:

*The Passing Scene, Main St., Who, Me?, The Human Race, R. I. P.* (*Rest in Peace*), *Smash Hits of the Year, Misguided Missiles.*

Table 17.8. Hours of Occurrence of Accidents, 1954

| Hours | Persons Killed | Percent | Persons Injured | Percent |
|---|---|---|---|---|
| 12 to 1 a.m. | 2,060 | 5.8 | 58,800 | 3.0 |
| 1 to 6 a.m. | 6,390 | 18.0 | 176,400 | 9.0 |
| 6 to 7 a.m. | 780 | 2.2 | 31,360 | 1.6 |
| 7 to 8 a.m. | 600 | 1.7 | 64,680 | 3.3 |
| 8 to 9 a.m. | 710 | 2.0 | 72,520 | 3.7 |
| 9 to 10 a.m. | 780 | 2.2 | 62,720 | 3.2 |
| 10 to 11 a.m. | 960 | 2.7 | 73,620 | 3.8 |
| 11 to 12 a.m. | 1,100 | 3.1 | 90,160 | 4.6 |
| 12 to 1 p.m. | 920 | 2.6 | 90,160 | 4.6 |
| 1 to 2 p.m. | 1,170 | 3.3 | 95,280 | 4.9 |
| 2 to 3 p.m. | 1,710 | 4.8 | 110,620 | 5.6 |
| 3 to 4 p.m. | 1,850 | 5.2 | 141,120 | 7.2 |
| 4 to 5 p.m. | 1,880 | 5.3 | 174,440 | 8.9 |
| 5 to 6 p.m. | 2,130 | 6.0 | 165,400 | 8.4 |
| 6 to 7 p.m. | 2,020 | 5.7 | 121,520 | 6.2 |
| 7 to 8 p.m. | 2,420 | 6.8 | 111,720 | 5.7 |
| 8 to 9 p.m. | 2,200 | 6.2 | 94,080 | 4.8 |
| 9 to 10 p.m. | 1,950 | 5.5 | 82,320 | 4.2 |
| 10 to 11 p.m. | 1,810 | 5.1 | 72,520 | 3.7 |
| 11 to 12 p.m. | 2,060 | 5.8 | 70,560 | 3.6 |
| Total | 35,500 | 100.0 | 1,960,000 | 100.0 |

The figures gathered for these booklets are important; some of them are presented in Tables 17.3–17.9.

These seven tables tell the following story:

1. Speeding is the greatest single cause of deaths and injuries. It accounts for 46 percent of the deaths and 43 percent of the injuries.

Table 17.9. Days of Occurrence of Accidents, 1954

| Days | Persons Killed | Percent | Persons Injured | Percent |
|---|---|---|---|---|
| Sunday | 6,530 | 18.4 | 313,600 | 16.0 |
| Monday | 4,370 | 12.3 | 260,680 | 13.3 |
| Tuesday | 3,660 | 10.3 | 231,280 | 11.8 |
| Wednesday | 3,940 | 11.1 | 237,160 | 12.1 |
| Thursday | 4,080 | 11.5 | 245,000 | 12.5 |
| Friday | 5,470 | 15.4 | 307,720 | 15.7 |
| Saturday | 7,450 | 21.0 | 364,560 | 18.6 |
| Total | 35,500 | 100.0 | 1,960,000 | 100.0 |

**"It's getting to be kind of a little game with Fred—so far, he's been hit by Connecticut, Vermont, New York and Oklahoma drivers!"**

*Figure 17.7.* (From "The Passing Scene." *The Travelers 1954 Book of Street and Highway Accident Data,* Travelers Insurance Companies, Hartford.)

2. Approximately one-quarter of the injuries and one-third of the deaths to pedestrians are caused by crossing between intersections.
3. About 85 percent of the accidents occur in clear weather.
4. At first glance the figures covering accident experience of male and female drivers in 1954 would seem to settle once and for all the question as to whether women are better or worse drivers than men. The weight of evidence is all in favor of the women!

   Actually, no country-wide figures are available to tell us how many more male drivers there are than female drivers, how much more mileage the average male covers in a year than does the average female, or the relative traffic hazards which each sex faces.

   Studies have indicated that on a typical day, men account for about eight times as many 'Car miles' as women, that men drive faster on the average (partly from necessity, as in the case of men using their cars for business purposes), that men often are forced by the nature of their business to drive when weather and road conditions are at their worst, and that men do more of their driving in the congested, hazardous areas.

   Until more data become available, it will be impossible to compare the safe driving abilities of men and women.

   Females in the under-26-years are safer drivers, i.e., have fewer accidents, than males of this age group. Again, it may be that they do not drive on dates and may drive less miles.
5. Most cars involved in crashes are apparently in good condition.
6. The hours between 4 and 6 P.M. are the most hazardous. People hurrying home from work as darkness falls may explain this.
7. Saturday is the worst day for auto accidents. Saturday and Sunday combined account for 39 percent of the deaths.

Accidents can be reduced not only by clinical studies of the accident-prone employee but by safety education conducted by management and employee groups. Foremen's meetings can be effective in reducing accidents, as Figure 17.8 indicates.

Accident prevention in industry is the responsibility of both labor and management. The United States Department of Labor has issued a "Guide to Industrial Accident Prevention Through a Joint Labor-Management Safety Committee" (25) which suggests an eight-point program for a safety committee:

1. Make immediate and detailed investigation of accident reports.
2. Develop accident data to indicate accident sources and injury rates.
3. Develop or revise safe practices and rules to comply with plant needs.
4. Inspect the plant to detect hazardous physical conditions or unsafe work methods.
5. Recommend changes or additions to protective equipment and devices to eliminate hazards.

6. Promote safety and first aid training for committee members and workers.
7. Participate in advertising safety and in selling the safety program to workers.
8. Conduct regular scheduled meetings.

Valuable work is being performed by the Committee of Highway Safety Research of the National Academy of Sciences (20). This committee serves as a center for the collection of information related to accidents and is also busily engaged in outlining desirable research programs. The following summary statements may be made:

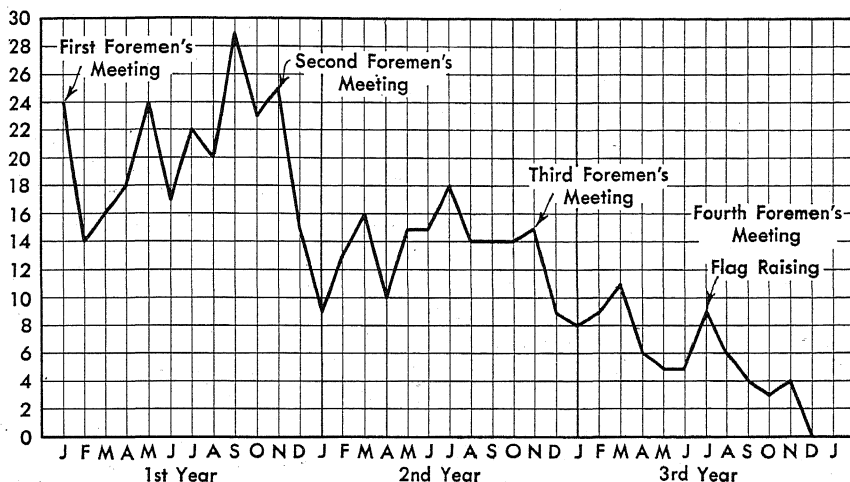



*Figure 17.8.* Foremen's Meetings Reduce Accidents. (Courtesy of the Metropolitan Life Insurance Company.)

1. Seventy-five to 90 percent of automobile accidents are due wholly or in part to human errors or lapses.
2. The accident records kept have value as a general index but are of questionable value as a criterion for research on accident causes.
3. Many drivers having multiple accidents in one period are accident free in a later period.
4. Factors leading to accidents are largely correctible or may be compensated for by greater caution.
5. Drivers between 18 and 25 years of age have far more than their proportionate share of accidents.
6. The effect of intensive safety education and enforcement "campaigns" has been shown to be immediate but temporary.
7. Psychophysical driver tests are probably of more value as educational than as selection devices.

8. Clinics for accident repeaters have been shown to have value. Whether this is due to increased knowledge, attitude change, or motivation is not known.

As to the causation of street and highway traffic accidents, Forbes offers the theory that a large number of trained skills and psychophysical reactions are required of drivers and that a variety of physical conditions may at times play a part in setting the stage for possible accidents. However, errors on the part of one driver may be compensated for by good judgment and skill on the part of other drivers in any given situation. Thus, not only must a critical situation occur as far as the physical variables are concerned, but a lapse or error of judgment on the part of two or more drivers (or pedestrians) simultaneously may be necessary to cause an accident.

This theory is highly tenable and could lead to considerable accident reduction. The theme ought to be that it takes two to have an automobile accident in all cases except when the single driver goes off the road or hits a tree. This view raises the very important question of whether "good" drivers on their own can avoid accidents. While their ability may be helpful, one must always consider the unpredictable actions of the other driver, who may not be as "good." The individual with fast reaction time might stop so fast as to contribute to an accident. The individual whose space judgment is perfect may cause unpredictable actions on the part of the so-called "poor" driver. The individual who knows the road so well that he can take the turn at excessive speed may find the "poor" driver suddenly in his path as he swerves.

Figure 17.9 ought to be memorized by every driver. It indicates clearly that no one can "stop on a dime." Going at a conservative 40 miles an hour, the car still travels almost three lengths before the foot is applied to the brake, and then another five lengths or a total of 128 feet.

Figure 17.9 is not included with the hope that reaction times will be improved. Its purpose is to urge drivers to cut their speeds.

As the country develops bigger and better super-highways and as the manufacturers of automobiles create better illusions of smoothness and safety, the human driver remains constant. It does appear as if the most important work to be done in this field is to educate and reëducate the driver. Possibly the most meaningful research that might be undertaken in this area would be a sound and thorough study of the personality of the automobile driver. However, concepts different from the ones we now

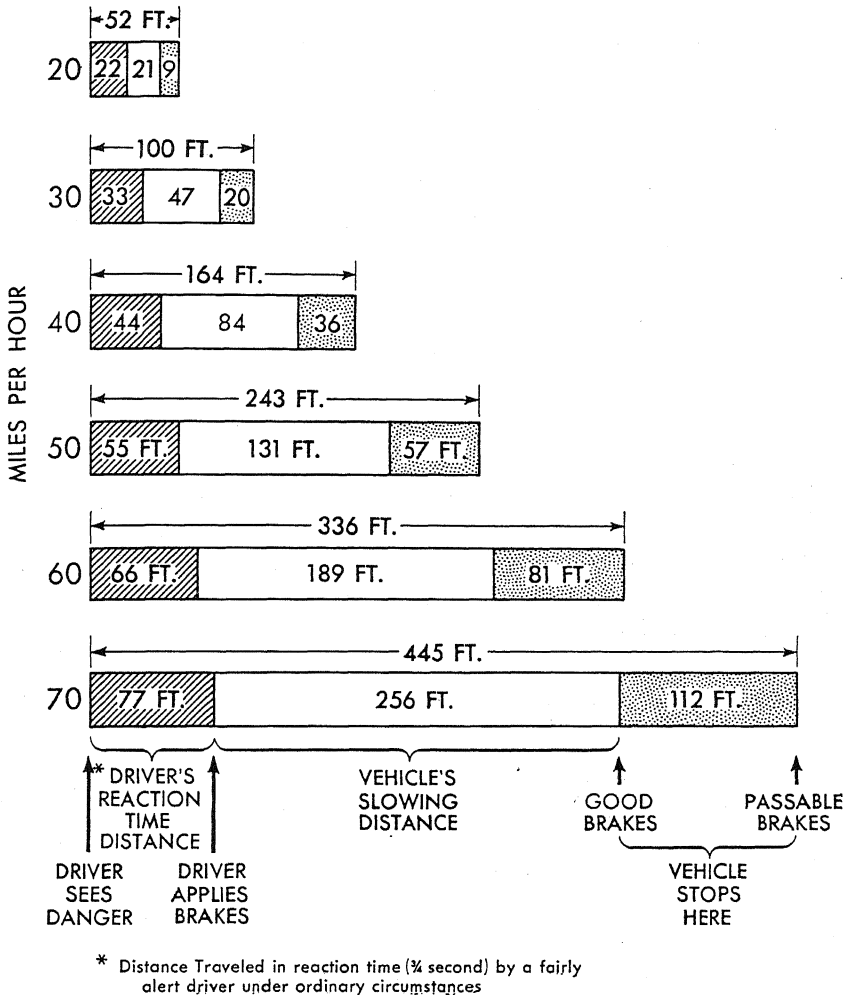



*Figure 17.9.* No One Can Stop on a Dime. (The figures in this diagram are used through the courtesy of the National Safety Council.)

have would have to be considered. For example, Harris (*11*) studied two groups of workers who were equated except for number of accidents. Using items from the Bernreuter, a personality inventory, and such projective techniques as the Rosenzweig Picture Frustration and the multiple-choice Rorschach he found no personality differences in the two groups. This study tends to be typical of most researches investigating personality characteristics and accident records.

Table 17.10. Twenty-One Behavior Statements Rated "Very Important" and "I Know I Can Rate on This" by 49 Percent or More of Drivers and Supervisors (26)

| Behavior Statement | Percent Checking "Very Important" A[a] | "Very Important" S[b] | "I Know I Can Rate on This" A[a] | "I Know I Can Rate on This" S[b] |
|---|---|---|---|---|
| Breaks the speed limit | 59 | 66 | 52 | 60 |
| Drives too fast for road conditions | 68 | 89 | 51 | 69 |
| Doesn't stay on his side of the road | 73 | 91 | 54 | 49 |
| Ignores stop lights or signs | 77 | 89 | 61 | 63 |
| Doesn't give the right of way to other drivers | 65 | 60 | 58 | 60 |
| Passes on curves and hills | 76 | 83 | 49 | 51 |
| Doesn't signal for stops or turns in advance | 57 | 71 | 60 | 63 |
| Doesn't check brakes before driving | 71 | 77 | 51 | 51 |
| Doesn't slow down at intersections when he has the right of way | 52 | 63 | 57 | 60 |
| Follows other vehicles too closely | 59 | 77 | 60 | 69 |
| Pulls away from the curb without looking back for oncoming traffic | 66 | 80 | 51 | 51 |
| Takes chances when driving | 50 | 71 | 51 | 54 |
| Gets into accidents with other vehicles | 64 | 63 | 50 | 74 |
| "Horses around" when he's driving | 62 | 80 | 50 | 54 |
| Shows off when driving | 61 | 74 | 49 | 60 |
| Doesn't cut wheels to curb when parking on a hill | 66 | 80 | 49 | 49 |
| Backs up without looking behind | 72 | 80 | 53 | 57 |
| Drives with dirty windshield | 55 | 57 | 58 | 71 |
| Swings too wide on turns | 55 | 60 | 50 | 54 |
| Drives faster than the other traffic | 54 | 49 | 51 | 51 |
| Fails to turn in his vehicle for repairs promptly | 60 | 60 | 50 | 77 |

[a] Associates
[b] Supervisors

McFarland and Moseley (*17*) analyzed the responses of "good" and "poor" truck drivers on four psychological tests, namely, Otis Employment, Johnson Temperament, Minnesota Multiphasic Personality Inventory, and Kuder Preference Record. In all, these tests include 1139 items, and 98 were found to differentiate the groups with statistical significance (+.05 level). The tests contributed items in the order named as follows: 12, 7, 13, 66. If these items stand the test of cross-validation, that is, are still significant when tried out on a new group of good and poor drivers, then an interesting test-inventory approach will have been offered.

Maybe an entirely different approach is needed. Possibly the identification of such driver types as the "overcautious," the "you can't do this to me," and the "show-off," if detected, might lead to a reduction of the horrible toll of accidents.

Uhlaner, Goldstein, and Van Steenberg (*26*), in a study of safe motor

vehicle operation, found 21 driving habits rated to be important. Table 17.10 can be a check list differentiating safe and accident record drivers.

Too many people have constantly made the assumption that driving skill is related to safe driving. Actually, this may not be true at all. Such a problem is worthy of serious investigation. Many of the tests included in batteries have constantly been found to have zero correlation with safe driving. Among the useless tests should be included those for color vision, simple reaction time, and visual acuity above a certain level. Simple reaction time rarely is a factor in the prevention of an accident; compound reaction time is a more appropriate concept. Possibly the main value of a knowledge of reaction time is the educational one of knowing that a driver cannot stop on the proverbial dime.

Attitude as related to safe driving and driving judgment appear to be more promising as instruments to predict safe driving than most of the psycho-physical measurements. In a study performed for the United States Army, by Lauer (*16*), a battery of tests for driver selection was found to be predictive of efficiency and included the following:

1. Attention to detail—as measured by the determining of the number of 0's with broken lines.
2. Driver self-description blank describing the driver's background and personality-attitude.
3. Driving "know-how" consisting of 48 items involving knowledge of driving beyond the wheel.
4. Emergency judgment and a pictorial presentation of traffic situations with the subject indicating his solution.
5. Two-hand coördination and motor coördination tests.
6. Word-matching. A visual perception test in which a word at the left is matched by one of five choices at the right. The task requires vision to read the word correctly as the size is successively reduced past the threshold of readability.

This approach of Lauer et al. is delightfully refreshing and may lead to more positive results than those in the past. The Uhlaner, Goldstein, Van Steenberg driving habits test may, however, be the most direct approach. This would require training and testing of knowledge of driving. It might effectively instill desirable safety habits necessary for safe driving. This approach may prove to be more important than an attempt to isolate the psychophysical skills involved.

Flanagan (*9*) suggests the study of near-accidents as a means of re-

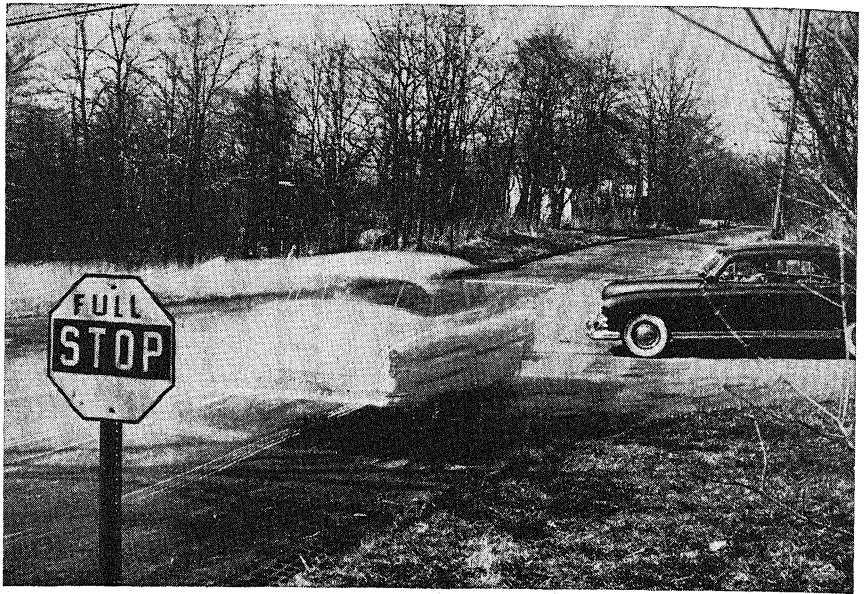



*Figure 17.10* Full Stops Are Friends and not Foes. (Courtesy of Standard Oil Co. [N.J.].)

*Figure 17.11.* Failure to Signal Properly May Mean You Will Never Have Another Chance. (Courtesy of Standard Oil Co. [N.J.].)

ducing accidents. A study conducted for the Air Force found that the main causes were: personnel acts, 61 percent; mechanical malfunction, 34 percent; design and procedure, 32 percent. (Some accidents had more than one cause factor.) The clear-cut implication is that human behavior is the greatest single cause of near-accidents, and while it is true that in this instance human behavior also prevented the accident, nevertheless every accident, at the moment prior to the occurrence, was the near-accident. The study of a near-accident can lead to the prevention of accidents if the causes to near-accidents can be more clearly determined. Such a view would apply to the industrial scene as well as to the automobile accident.

McFarland and Moseley (*17*) have done similar work with truck and bus drivers. Their findings are quoted as follows:

> Two studies were made of near-accidents—one in long haul trucking operations, and one in long haul bus operations. In the former, an observer, riding on overnight hauls totalling 5,000 miles, recorded the circumstances of 48 near accidents. A prominent feature of these incidents was the failure of the driver being observed to drive defensively, thereby contributing to the development of the critical situation as well as directly bringing it about through operational errors. Roadway features and other conditions which restricted visibility of the highway ahead were characteristic of many of these situations, as were sudden maneuvers by other vehicles. The elapsed time for many of these near accidents was such that, without fortuitous circumstances which permitted a successful evasion through a steering maneuver, emergency stops could not possibly have been completed prior to the collision point.
>
> A more extensive study of near accidents in bus operations yielded findings consistent with the foregoing. In addition, it was observed that the most frequently occurring near accident involved "cornering" in overtaking and passing maneuvers. Driver errors and the failure to drive defensively were by far the most frequent causes of the situations observed. In some cases the personal characteristics or the physiological condition of the driver were important in the production of driving errors, especially those involving insight and judgment. Again, a record of the time elapsed in the near accidents indicated that the limits of reaction time and braking capabilities of vehicles are frequently exceeded, so that the possibility of successful evasive tactics depends upon defensive driving in many near accidents.
>
> In general, near accident situations appear to be related to both the personality and physiological condition of the driver. During emotional disturbances or extreme physiological changes such as those involved in the utilization of certain drugs or under conditions of extreme fatigue, the driver may be more likely to be involved in near accidents. Since such incidents develop very quickly and are of short duration the time factor is critical. The proper corrective action must be taken as soon as possible. The success of the maneuver

will depend in part upon the total environmental situation in which the emergency occurs and will be influenced by variables such as traffic, weather, roadway conditions, illumination, pedestrians, animals, toxic gases, and the mechanical condition of the vehicle. It is thus important that the driver be highly trained in the techniques of defensive driving. The two major elements in defensive driving are (a) to spot the near accident situation in its earliest development, and (b) to carry out a defensive procedure without delay.

Near accidents can provide valuable clues to accidents which do happen. A study of near accidents can reveal (a) the kinds of emergency situations which occur, (b) the various factors such as speed of maneuvering and driving skill which are important in driver reactions, (c) the relationship between the driver's normal habits and the near accident situations in which he becomes involved, and (d) the ways in which an accident can be prevented by observing the errors that brought about the near accident. These may well constitute clues to the difference between the accidents that did happen and the accident that did not happen; clues which may be developed into a practical fleet program which will make the accident that did happen a less frequent and less serious event.

## Summary

A study of accident records reveals that some people have few or no accidents and others have many. The fact of such a distribution of accidents has led to the misunderstanding and overemphasis of the principle of accident proneness. When more people are found to have more accidents than normal chance expectancy indicates, the existence of accident proneness can be recognized.

There are many causes of accidents; they include the physical factors in the environment as well as the human factor.

The psychologist is interested in accident reduction in terms of the human factors which contribute to accidents. There are two approaches to this problem. The clinical method emphasizes the study of the individual; safety education involves the group.

On the basis of his study of automobile drivers involved in accidents, De Silva believes that four factors determine a driver's susceptibility: exposure, speed, skill, and safety-mindedness. He favors the clinical approach in studying these drivers and the use of apparatus tests which measure driving aptitude.

Safety training programs, provided they are the responsibility of both management and employee groups, can help to curb the accident rate.

Forbes' collation of highway accidents information leads to the awareness that most accidents involve actions of at least two drivers. This

means that the "good" driver can contribute to accidents as well as the "poor" driver.

The study of driver habits and near-accident situations may lead to reëducation resulting in accident reductions.

*Human Factors in Highway Transport Safety* by McFarland and Moseley (*17*) is being singled out as a most valuable research effort. It is comprehensive and represents research with emphasis on program.

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# PART V • Product Distribution

THE industrial psychologist must follow through the industrial process from manufacturing to distribution. The tendency to omit from a system of industrial psychology such topics as consumer research, advertising, and selling has gone too far. If it is not reversed, it must lead to a schism that will make the psychologist less useful in industry and business.

Much work needs to be done in this area and by more rather than fewer psychologists. If it is not, the field will be left to pseudo-psychologists and then real harm will be done. Accordingly, Part V of this text is devoted to the distribution process and the psychologist's involvement.

# CHAPTER 18

# Consumer Research

**THE** importance of the consumer is being recognized more and more in the marketing, advertising, and selling of products, not because of mere altruism on the part of the manufacturer or seller, but because it is good business from a public relations view and also profitable. Knowledge of the consumer's tastes, needs, and desires enables the businessman to function more successfully, for he can thus provide what the consumer wants and does not have to try to force him to take what he has.

As business continues to develop on an increasingly large scale, the producer and the consumer tend to become more widely separated. As a result, the only knowledge the producer has of the consumer may be his own bias, casual contact, or personal impressions of his friends and relatives. Such information is likely to be extremely limited and therefore inaccurate. In order to feel the pulse of the public, a scientific and systematic means of investigating the public's needs and desires must be used. Such a system is usually called market research. The author prefers the term "consumer research." The two are similar, but consumer research places the emphasis where it should be—on research for consumption by the consumer, rather than on research for marketing.

### Uses and Abuses

According to Lawrence C. Lockley (*2*), there are eight common uses for consumer research.

1. Testing new products.
   This often provides a basis for predicting success or failure of the new product and affords a comparison between it and the products with which it will have to compete.
2. Appraising the attitude of consumers toward established products.

Knowledge of the satisfaction of the present customers for the product, and information as to whether younger people use it as much as older people, gives an indication as to the continued success of the product.

3. Determining the strength of competitive products.
   Comparing one brand and the other competitive brands enables the producer to know how his product stands in relation to the competition.
4. Measuring the extent of the market for products.
   A product breaking into a field may be successful or not depending upon the extent of the existing market. This information is useful to the producer.
5. Finding new uses for products.
   The increased market for a product often depends upon the discovery of new uses; this type of research provides meaningful leads along these lines.
6. Determining marketing channels.
   Market research can often suggest leads for the more successful distribution of a product. Some products may not be sold through the mail but research may indicate that there are no obstacles to such additional distribution.
7. Checking the efficiency of distributors, wholesalers, and retailers.
   Checking with the consumer often indicates a discrepancy between the manufacturer's estimate of his distributors' efficiency and their actual efficiency. For example, in a gas station selling a particular brand of gasoline, there is often a vast difference between the condition of its rest rooms as described in advertisements and the actual conditions.
8. Determining unsatisfied needs of consumers.
   Research often indicates the need for certain products which are within the realm of the manufacturing and marketing process and which the manufacturer can readily undertake to produce.

Other authorities have proposed somewhat different uses and some have suggested more than eight. It should be emphasized that there is no particular magic in any one list. There are many uses for consumer research, and Lockley's list illustrates some of the more common ones.

Although the uses of consumer research are many and varied, there has grown around the field a series of abuses which ought to be mentioned.

Many people in the field of advertising and market research have been

referred to as hucksters. This unfriendly term should not label all researchers in the field but a number of the reports in this area seem to be the prototype of "directed research."

The main abuse centers around the problem of whether the research was conducted to establish a hypothesis or simply to lead to foregone conclusions. Cigarette companies and magazines frequently refer to research studies. As anticipated, the sponsor of the advertisement always wins the poll.

John Crosby, New York *Herald Tribune* radio and television columnist who writes wisely and with satire as well as humor, published a column called "You Can Prove Anything" (5). Because it so beautifully presents the irony of the abuse it is quoted in its entirety.

YOU CAN PROVE ANYTHING[1]

One of the wonderful things about this age of electronics is the research business, which can prove anything you like with absolute dependability and a magnificent flow of statistics. The more money you spend on your survey, the more positive is the conclusion and, of course, the more beautiful the pamphlet embodying your research.

It has always seemed to me that the fundamental purpose of any survey is to prove what you set out to prove—not, for heaven's sake, to discover what the facts are. Now you take the football situation. Does television affect football attendance? Or doesn't it? The National Collegiate Athletic Association, which rather wanted to prove that TV *does* hurt football attendance, hired the National Opinion Research Center of the University of Chicago for $50,000 to survey the situation. They spent the $50,000 and proved exactly what the N. C. A. A. wanted proved. "Television does definite damage to college football attendance."

Let's leave it at that for a moment and turn to another survey. The National Association of Radio and Television Broadcasters paid the bills for this one. The conclusion sought—and I mean just that—was exactly opposite to that of the N. C. A. A. The broadcasters wanted to prove that TV didn't hurt the gate—and damned if they didn't prove just that. In fact, this survey proved—and I use the word "proved" with some misgiving—that football attendance was better in television areas than in non-television areas, leading to the suspicion that TV helped the gate rather than hurt it.

What are we to make of those diametrically opposite conclusions from two research outfits dealing in the same situation? My feeling is that we ought to switch them around, that the broadcasters ought to hire the National Opinion Research Center and the football association ought to hire the other outfit, each of them to disprove conclusively what they have already proved conclusively. For $50,000 this shouldn't be hard.

[1] Copyright, 1952, New York Herald Tribune Inc.

This doesn't mean that the researchers are not adequate to their tasks; it means, instead, that they are entirely too adequate. They can, as I say, prove anything with any set of facts. One research man—who shall be nameless—was given the N. C. A. A. survey which, as I say, stated conclusively that attendance losses were very much greater in television areas than in non-TV areas. This man's conclusions were an indictment not only of this survey but, it seems to me, of *all* surveys.

"Very difficult to give the truth in any situation. In absence of truth, intuition is oftentimes used." (Well, well, well! I've always rather suspected that it was intuition that put Milton Berle on top of the rating list and intuition that dethroned him.) Here are a few of the other comments: "Futile and socially harmful." "Unorthodox in certain research presentations." "Indefensible distortions in other approaches or presentations." "Certain inferences and deductions impermissible and intemperate." "Alternative viewpoint equally permissible from same data."

That last statement alone—namely, that a researcher could draw absolutely opposite conclusions from the same data—is fairly startling. But then the whole thing is pretty startling. A man has to think back to 1948 when Mr. Gallup had President Truman conclusively and irrevocably defeated for re-election to get the full flavor of this disagreement over televising football.

In considering the value of consumer research—and its potential value is significantly great—one must carefully determine such things as: Who paid for the study? How was it done? What relation exists between the data, the results, and the conclusions? and Is the study a means of promoting advertising or selling or is it free, independent, and experimentally controlled research?

### Extent of the Field

The field of consumer research is very broad and gradually shades into such different areas as providing marketing information at one extreme and predicting election results at the other. To be arbitrary, at least six different fields use the same basic techniques of consumer research: the political field, the social field, advertising, selling, public relations, and housing.

The political polls conducted by Gallup, Roper, and Crossley are the most widely known examples of consumer surveys for predicting election results. There is a definite relationship between political opinion polling and consumer research. However, the big pollsters are not too happy about conducting political polls. They do it simply because market research is in its infancy and they must demonstrate their ability to predict accurately an event in the immediate future. They can use this as a selling

point in offering their services to an industrial organization that wants consumer information about its products provided the accuracy of that information can be demonstrated.

Political opinion polling has stirred up a heated controversy and many attacks have been made on it. It is claimed that such polls, if reported dishonestly or if misinterpreted, can actually affect the outcome of an election. Wroe Alderson (2) has presented a very frank discussion of this topic. With a minimum of punch-pulling he describes the Roper, Crossley, and Gallup polls. Of the Gallup polls he writes: "The final forecast of the Gallup poll is usually so hedged that all the preceding field work and analysis seem futile. The accuracy claims are overstated and not warranted by the facts. . . . This journalistic requirement has led to two unfortunate practices. One is an extreme form of hedging in final forecasts; the other is making specious claims of accuracy following elections."

Another form of consumer research is the social poll. The National Opinion Research Center, when it was affiliated with the University of Denver, conducted a continuing poll on topics of interest to the consumer as a citizen. For example, Report No. 16, December, 1943, was "Are Wars Inevitable?" At that time, six out of every ten Americans with an opinion on this subject believed that there will always be war. The differences of opinion between age groups were insignificant, but more persons in the lower than in the upper educational, economic, and occupational groups tended to consider that wars are inevitable.

More intimately related from the industrial point of view is the consumer research done in the advertising field. Copy testing and measurement of the general effectiveness of an advertisement are commonly used means of evaluating advertising campaigns. Since the chapter on advertising deals with this in considerable detail, only this brief mention is made here.

Consumer research has also been used to develop effective means of selling a product by determining the consumer's attitude toward the product, as well as its uses and price structure. In this way the practice illustrated by the popular slogan "Macy's won't tell Gimbel's" can be counteracted. In other words, information about a competitor can be secured with considerable accuracy and within the ethics of business. For example, the manufacturer of brand A coffee can determine brand acceptance as well as secure various other kinds of information about all the other competing brands by asking a series of questions beginning with "What

is your favorite brand of coffee?" A department store may ask a sample of the population such questions as "What is your favorite department store?" "Why?"

Consumer research is also useful in connection with the public's opinion about a company. For example, if a company has a history of industrial strife because of a poor labor relations policy, this may give it a reputation that eventually spreads to at least some of the consumer population. It may result in a refusal to use the product or, worse, in the spreading of rumors about its inadequacy. Consumer research that seeks to determine the generalized attitude of the consumer toward either the company itself, its employees, or its product may provide leads by which, through concerted effort, this popular feeling can be changed.

Homes and houses offer a fertile field for the investigation of consumer attitude. Most Americans, when they buy a home, immediately enter into an owning partnership with a bank. The down payment often represents a considerable portion of their life savings to date and the mortgage payments continue for a very long time. The consumer has intense attitudes related to space and design needs and these may or may not be related to costs as well as architectural and engineering principles.

In a survey for the *Architectural Forum* (*9*) an effort was made to estimate the prospective housing market by questioning consumers. This study attempted to differentiate between the "daydreamers," who comprise about one-third of the population, and people who are "rather realistic." The realistic group was much smaller, comprising about 7.5 percent of the population, or approximately 2,778,000 families. The report is based on this group. The survey indicates that cost is perhaps the most important factor in determining the purchase of a house, especially among the low- and average-income groups. Fifty-two percent said that they would spend somewhat less than $6000 for a home; only 11 percent would spend $10,000 or over. In view of the discrepancy between the cost of houses at the present time and the consumer attitude expressed in this study, it is not surprising that people spend much time in looking and not finding what they want.

In another study of the housing field, conducted by Blum and Candee (*4*), two groups of families were equated for size of dwelling, income, size of family, educational background, and other socioeconomic factors. The two groups differed in that one group lived in tenements and the other owned one-family houses. Such functions as sleeping, dressing, washing, and elimination were minutely investigated by the interview,

inventory, and diary techniques. The major concern in this study was to determine actual space needs. For example, the inventory of a wife's clothing which was taken could be translated into the amount of storage space needed. Such findings can answer questions as to the number of closets, drawers, and shelves needed. They can also lead to practical suggestions on the functional design of furniture and the more efficient use of a room. A survey of this nature is not far removed from research which can be put to marketing use. For instance, information about the average number of sheets, towels, dresses, and other items owned by families at various income levels can tell a manufacturer or an entire industry much about the development of potential markets or present needs.

Just as one can gain perspective on the scope of market research by considering the fields in which it has been conducted, so he can gain a similar perspective by knowing the different types of organizations that conduct consumer surveys. Such organizations can be classified under the following six heads: market research companies offering syndicated or private services, advertising agencies, magazine publications, manufacturing companies, government departments, and educational institutions. Only a few examples of the various organizations will be given; no attempt has been made to approach a comprehensive listing.

Some organizations offer syndicated or private marketing research services. They have clients for whom they conduct surveys, each client receiving a copy of their report. The Brand Barometer of the Psychological Corporation, the Hooper Measurement of Radio Audience and Sponsor Identification, and Gallup's American Institute of Public Opinion are typical examples.

The larger advertising agencies have their own research departments and the market research divisions play a large role in such research. Young and Rubicam and N. W. Ayer & Son are two of the many advertising agencies active in this field.

Some magazine publications such as *Time* and the Curtis Publications have their own market research divisions.

Another type of organization which often does consumer research is the large manufacturing concern. General Motors places considerable emphasis on the importance of consumer research.

Various departments of the federal government stress consumer research. The Surveys Division of the Bureau of Agricultural Economics, Department of Agriculture, has contributed much useful material to the development of the field. This division not only serves the Department of

Agriculture but, during the war, conducted surveys for the Treasury Department and other branches of the government. Possibly the most outstanding contribution of this group has been the utilization of the "open-end" question. This type of question allows the respondent to answer in his own words. Those who use it claim that it avoids the dangers of suggesting plausible answers and further that it leads to a much fuller understanding of the respondent's attitudes.

One other type of organization that conducts consumer surveys is the educational institution. The Bureau of Applied Social Research, which is an outgrowth of the Office of Radio Research of Columbia University, the National Opinion Research Center of the University of Chicago, and the Survey Research Center of the University of Michigan are three of the more widely known endowed consumer research agencies.

When a group of people known as "market researchers" get together, people trained in many different professions are likely to be represented. Equally at home in the field of consumer research are the psychologist, sociologist, statistician, economist, journalist, and others who for lack of a better identification are called just "marketeers." It may be that in the future this work will be recognized as a separate profession. If this happens, it would be best for a market researcher to have adequate training in each of the various professions now represented in the field. No single profession, by its background or training, is more eminently qualified than any other and each has a distinct contribution to make.

### Steps Involved in Consumer Research

Although there is no definite agreement as to the exact number of steps necessary to conduct consumer research, there is not a vast difference of opinion. Generally speaking, at least nine steps are usually necessary:

1. Statement of the problem.
2. Methods of collecting data.
3. Development of the questionnaire.
4. Sampling.
5. Supervisory and field worker training.
6. The interview.
7. Analysis of data.
8. Report presentation.
9. Payment of respondents.

### STATEMENT OF THE PROBLEM

Just as in individual therapy the patient's statement of his problem often fails to present the real problem, so in consumer research management's statement about the problem often does not give the real reason for the research. The problem is frequently stated in such vague terms as "a desire to increase sales." While consumer research may be able to secure data that will eventually lead to an increase in sales, the research organization must often aid the industrial concern to specify its objectives so that an effective procedure can be planned.

As an aid to a more objective statement of the problem, Blankenship (2) suggests a three-step process. First there is the situation analysis, in which a sufficient background of information is gained about the client, the industry, and the general problem. The second phase is informal investigation. Here emphasis is on exploration of the subject, and intensive informal interviewing of consumers or other likely individuals is carried on by experienced investigators to add to the background material. The third step is an integration of the first two and results in a statement of objectives. This restatement of the problem sets the stage for the study and avoids any misunderstanding between what the sponsor believes may be uncovered by the survey and what actually does result. There must be a clear statement of the problem and agreement between the researcher and the sponsor; otherwise the sponsor may be very dissatisfied with the results and be convinced that all the data collected represent a sheer waste of time and money.

### METHODS OF COLLECTING DATA

As soon as the exact nature of the problem is known, a decision must be made as to how the data will be gathered. There are four main techniques for gathering data—the telephone, the mail, the interview, and mass observation. Each has certain advantages and disadvantages. For example, the telephone is economical (provided long-distance calls are not made) but has the disadvantage of being unable to provide a true cross section of the population. Samples based on telephone subscribers do not include the large segment of the population in the lower socio-economic brackets.

The mail questionnaire also has the advantage of economy and allows the respondent to answer at his leisure. However, the replies always constitute a small percentage of the total number sent out and are most often

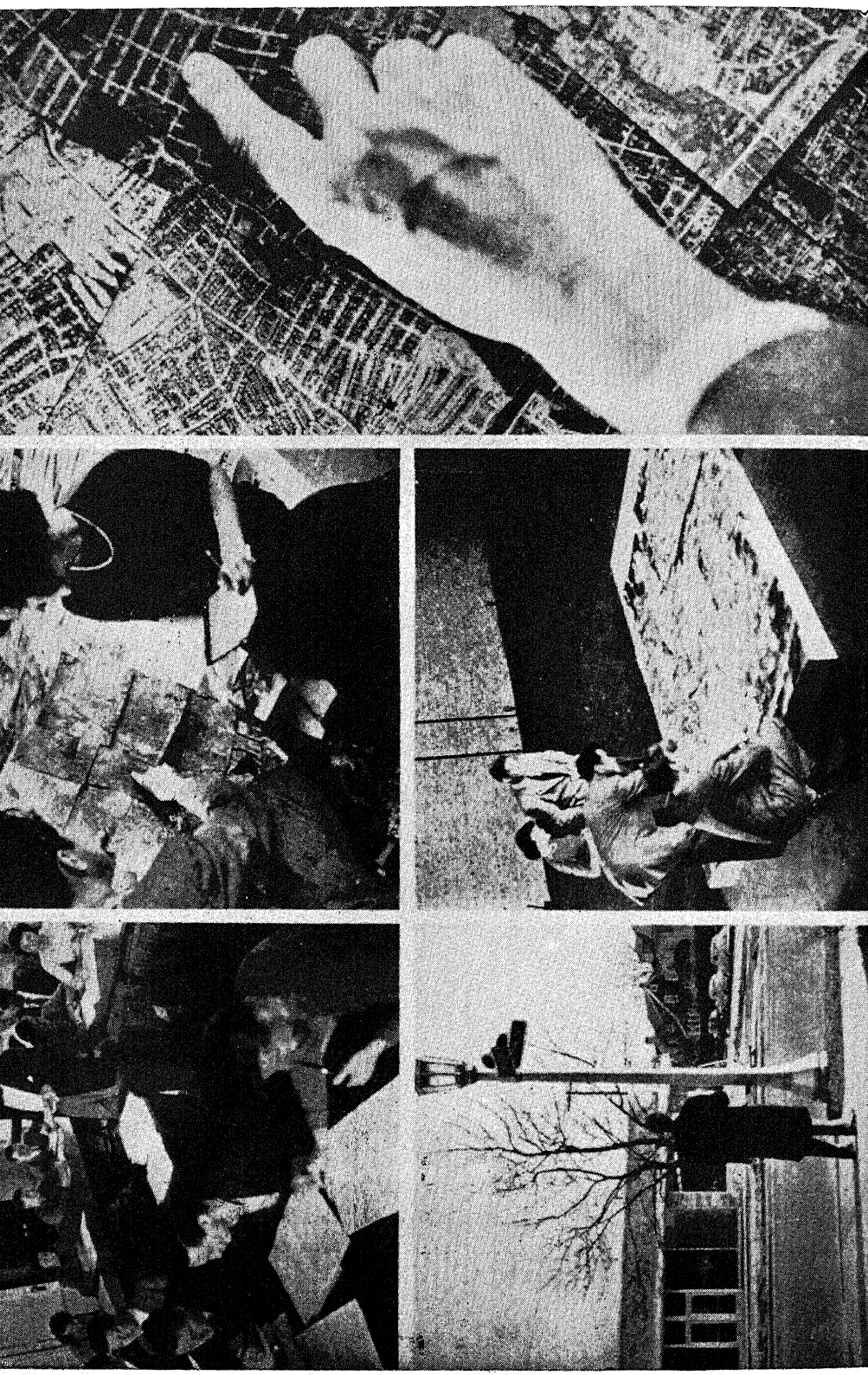
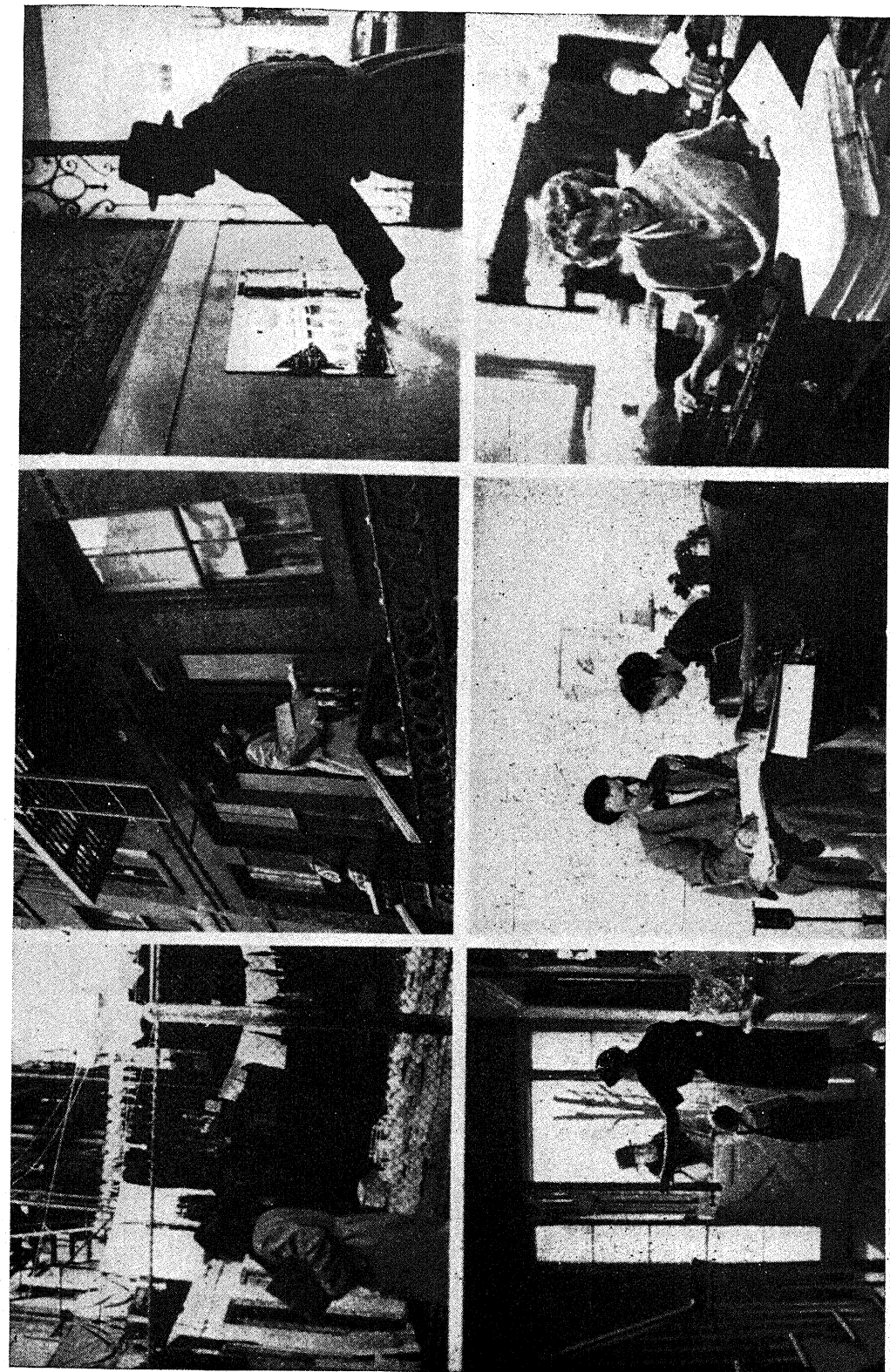



Figure 18.1. Steps Involved in Consumer Research. (From *TV Today: Its Impact on People and Products,* by Thomas E. Coffin, New York, National Broadcasting Company, 1951.)

typical only of the respondents, rather than of the entire sample. For example, a survey to determine the earnings of college alumnae clearly showed that the typical respondent earns more than the non-respondent. In this study the women who failed to respond to the mail questionnaire (the non-respondents) were repeatedly asked to do so, and a large enough sample of this group was thus obtained.

The third method of gathering data is the personal interview. The disadvantages of this method are the possible bias of the interviewer and the expense of conducting the survey. The advantages, however, are many, for face-to-face contact makes possible interpretations which enable one to evaluate the data more validly.

By and large, considering the advantages and disadvantages of each method, the best way to gather data is through the interview. If research is worth conducting at all, it should be done in the best possible manner. Telephone calls and mail responses leave too many loopholes, and much time and money can conceivably be wasted interpreting data that are neither reliable nor valid in the first place. The interview method is, of course, no guarantee of the reliability or validity of the data, but adequate controls can be introduced to enhance their value.

The mail and interview methods have recently been combined in a way that successfully eliminates the disadvantages of each. A population is sampled by mail, and the people who did not respond are then interviewed. This procedure overcomes one common criticism of the mail technique—"The researcher does not know anything about the non-respondents"—and yet saves much of the cost of interviewing the total population.

The fourth method of collecting data is mass observation. This is not widely used but deserves mention because of its potential development. A person trained to observe group behavior can gather not only quantitative but even qualitative data. For example, observing customers as they enter a department store can yield information as to whether they make a beeline for a certain department or wander around. Watching people passing window displays can provide information as to the type of display which attracts crowds.

One technique that has been used only informally to the best of the author's knowledge but that could, with a minimum of energy, give valuable results, is the observation of people's reactions in a theater or movie house. A ready-made laboratory exists every time a newsreel is shown. In most theaters applause, cheers, boos, and hisses are clearly audible.

If the characteristics of the audience were known and this mass observation were carried on in a number of theaters varying both geographically and economically, measurement of the audible reaction might give valuable information as to the popularity of political candidates, etc. It might even spot trends in the popularity and unpopularity of such social phenomena as strikes, wars, sports events, etc.

### DEVELOPMENT OF THE QUESTIONNAIRE

Data are often gathered by means of a formal or informal questionnaire. Developing a questionnaire is one of the most difficult steps in consumer research. The expert readily admits that a number of revisions are necessary. It is not exaggeration to say that, regardless of how experienced a person is, at least six revisions are likely to be required. Each questionnaire must be pretested. A good principle is to eliminate or change any question that is not clearly understood by the trial respondents.

Despite the fact that most people believe that an effective questionnaire can be constructed with ease, this is not true. There are many difficulties in the art of asking a question. A question must not be ambiguous. Although it may be clear to the person who asks it, it may not be clear to the person who must answer it. College students will agree immediately with this statement when they think of their struggles during an examination because they believed that any one of a number of answers could be given to a question but did not know which one the professor would regard as correct. In other words, his question was ambiguous.

Frequently words are introduced innocently into a question which either have no meaning to the respondent or can be interpreted by him in different ways. Such words as "often," "usually," and "sometimes" may mean the same thing to different respondents. The question: "What kind of oil do you use?" is ambiguous out of a context. It might mean auto, fuel, mineral, or household oil. Even if this were specified, the respondent might give the brand name or the weight. In each case, he would answer the question, but his answer might be useless to the researcher depending upon the specific information he desired.

A good question is phrased in specific terms and allows the individual to offer an answer without embarrassment. "How many razor blades do you use in a year?" and "How many times have you gone to the movies in the last year?" are difficult questions for the average person to answer accurately. Limiting the experience to one week would make possible a

more accurate response. Limiting the situation to the week just prior to the interview would give even more accuracy; then all the researcher has to do is to determine whether that week is typical. If it is not, then he finds out how it differed from other weeks.

Questions should not be leading. As a rule, the respondent is more willing to agree than disagree; if he has some hint from the interviewer, he will be anxious to please. For example, if one asks the question: "Do you smoke Blanks?" many people will answer "Yes." Some may mean that they smoke Blanks regularly, others that they only smoke Blanks when they are offered them. If the respondent can answer the above question only with "yes" or "no," the data might indicate much wider consumption of the brand than is actually the case.

There are two types of leading or biased questions but both have the same effect, the distortion of fact. Unintentional leading questions are unfortunate because they lead to erroneous conclusions. Intentional leading questions, such as those designed to convey the impression of wide use when it does not exist, are often used in "directed research" and are not only unfortunate but unfair.

However, Politz takes a very different position (*17*). He states, "The biased question becomes an essential instrument of investigation." Further, he believes that "mass questioning which assumes that people have opinions and that consumers know what they want is the opposite of predictive research." Politz is making the point that opinions depend upon information and that they change with additional information. He therefore prefers opinion-forming interviews as the basis for prediction.

Although the stand Politz takes is not shared by the majority of researchers in the field, it must be noted that it represents a courageous view and may be correct and productive, under certain specific conditions: first, that the interview situation is unreal, the respondent has no opinion based on information, and the information offered is honestly intended to help form an opinion; second, that the researcher does not have the intention of conducting "directed research" in a biased fashion.

The wording and form of a question may innocently distort the answer. For example, when people were asked, "Have you read *Gone with the Wind?*" a large proportion of the respondents claimed that they had. A more accurate tally of the number of readers of that book resulted from the question "Do you intend to read *Gone with the Wind?*" This gave those who had not read it an opportunity to say that they intended to read it; those who had actually read it said so.

Words themselves are frequently loaded with bias and emotion. People often answer a question according to their response to a biased word. Such words as "force," "radicalism," "relief," "depression" often have different emotional connotations for different people and bias the answers in one direction or another. The presence of the word "Eisenhower" in a question would call forth a different answer from that which would be given the same question without this name in it.

Numerous studies have shown that the order of the question often determines the response. For example, the attitude of radio listeners toward advertising was more tolerant when the preceding question asked whether listeners should pay fees in order to eliminate the necessity for advertising.

Another factor which determines the results of a questionnaire is the type of answer the questions encourage. The percentages of "yes" and "no" responses will be different depending upon whether only these two answers are possible or whether three are possible, such as "yes," "no," and "uncertain."

Sometimes the respondent is asked to check one or more of a list of items. This procedure often confines the answer to the number of items on the check list; and if by any chance the most usual response is omitted from the list and space is added for "other," the most usual response is likely to be relatively rare. Care must be exercised regarding the order in which the items appear on a check list. Restaurants have conducted research on the relationship between their customers' orders and the position of food items on menus. They have found that some positions are preferred to others and that items in favored positions are ordered frequently.

The development of a questionnaire is fraught with danger and is far from being as easy as it appears to be. Since the science of questionnaire building is not exact, it must be remembered that there is still an art to the task to be developed through practice.

### SAMPLING

After the questionnaire has been made and pretested, it is ready for use. Who and how many people are to be asked to take it is a serious problem of consumer research. A good questionnaire administered to a faulty sample is useless. Further, the size of the sample must be determined so that the research can be conducted within the limits of the budget. Large samples, in and of themselves, are no guarantee of ac-

curacy. Much has already been written about the ill-fated *Literary Digest* poll, which during 1936 conducted a presidential poll using a bigger sample than the other polls but which also made a greater error in predicting results than the other polls.

In the main, there are two types of sampling: *random* and *stratified*. In random sampling every fifth, tenth, twentieth, or one-hundredth person is selected arbitrarily on the assumption that these people will, on the average, have characteristics similar to those of the total population. Hooper, for example, uses random sampling in conducting his radio audience surveys. In any particular city, his organization telephones every "x" name in the directory. The only time that a random sample is warranted is when a population is available all members of which have some specified characteristic in relation to the problem being investigated. For example, if the researcher wanted to determine the attitude of store owners who sell a certain product, he would be justified in visiting every "y" store owner who sells the product; he would waste time if he visited storekeepers who do not sell it. However, there are certain pitfalls in the use of random sampling, in addition to those already implied. For example, if an interviewer who is to visit every tenth house hold finds that the housewife is not at home, what is to be done? Certain identifying characteristics of the "not-at-home" may deserve consideration; and if only a random sample of the "at-homes" is used, different conclusions may result. It has been discovered that interviewers have more refusals from housewives in the lower socioeconomic groups in the morning, and more refusals from those in the higher socioeconomic groups in the afternoon. The housewife who is at home in the afternoon may have finished her daily tasks and be resting, and the one who is not available may be out visiting. Such factors as these often differentiate the socioeconomic status of housewives.

Stratified sampling is used when certain characteristics of the population, known in advance, must be considered lest they unduly affect the results. The sample can be selected so that it will possess these characteristics in the same proportions as does the total population. Numerous controls are introduced in securing a stratified sample. The more obvious are geographic distribution, sex, age, education, income, occupation, and sometimes nationality and religion. A useful aid to any market researcher in this connection is the statistics of the United States Bureau of the Census.

In market research, the standard of living is an important aspect of

stratification. However, most people are sensitive about stating their exact income—especially to a stranger—and hence other means to obtain such evidence must be used. Various indicators of family income can be obtained without asking the embarrassing question directly. Most authorities are in agreement that there are four economic groups: Group A includes approximately the highest 10 percent of the population. Group B consists of the next 30 percent. Group C includes the lower middle class and comprises 40 percent. Group D represents the remaining 20 percent, or the lowest segment of the population. However, there is some disagreement as to the specific indicators which best reflect these four groups. Among the more commonly used indicators here are rental or cost of dwelling, occupation, car ownership, number of electrical appliances, and last, but not least, the intuitive rating of the experienced interviewer.

In stratified sampling, the interviewer is instructed in advance as to how many respondents are to be seen in the various areas of stratification. The returns must, of course, be checked to make sure that the sample has the same characteristics in relation to the overall population.

Increasing the size of the sample can be effective only in reducing errors due to chance; it does not reduce errors due to bias. Bias errors can be eliminated through adequate stratification of the sample. Adequate stratification makes it possible to work very successfully with small numbers. It is not too far-fetched to believe that the time will shortly arrive when even nation-wide surveys will be conducted accurately with as few as 500 respondents.

A relatively new development in the sampling technique is known as area sampling. The outstanding characteristic of the area technique is that a limited number of specific regions are intensively investigated, for it has been found that carefully selected small areas can be representative of many large regions. In area sampling the interviewers do not select their own respondents in order to fill specified quotas for different types or characteristics, but receive specific instructions regarding the households they are to visit. These households have been selected by means of stratified-random sampling.

In a study of war housing directed by the author, nine communities were selected as samples of areas throughout the United States in which there had been considerable war-housing construction. Lists of dwellings had been prepared on the basis of previously established characteristics of war-housing dwellings and the interviewers were required to obtain

the information from these lists. It was assumed that it would be more advantageous to investigate each of these areas intensively than to spread the sample too sparsely over many more areas. Since the main point of the investigation was to determine the adequacies and inadequacies of war housing, it was possible to obtain this information from the nine areas selected.

The size of the sample is also an important consideration. There has been a tendency within recent years to minimize the magic of large numbers; in fact, some nation-wide polls at the present time are based upon as few as 2000 to 4000 respondents. There is considerable evidence to indicate that just as accurate a result can be obtained from a small sample like this, provided the characteristics of the total population are known.

#### SUPERVISORY AND FIELD WORKER TRAINING

The weak spot in consumer surveys frequently lies in the supervision of the field staff. Sufficient attention is usually devoted to the development of the questionnaire and the scientific study of the sample to be polled. However, all this good work can be invalidated unless the same attention is given to the selection of the field supervisor. The value of the data collected depends upon the ability of the interviewers and the supervision they are given. Every field survey should have someone who is in charge of the interviewing. This person's work should include such tasks as the selection of the interviewers, their general training if they are inexperienced, and specific training if they have had previous experience in methods of interviewing.

The field supervisor should be available to the interviewers at least once a day—and preferably in the field. There is no end to the number of unforeseen situations which arise and which often require the supervisor's judgment. For example, a housing survey conducted by the author was to include only "bona-fide families," defined as husband, wife, and children living together but with no other adults in the household; however, it was necessary for one interviewer to contact the field supervisor for clarification of these specifications. Apparently, on the day the interviewing began, all the families met these specifications; but on the second visit, one housewife told the interviewer that her husband had left her but that she was willing to continue with the survey. Since the interviewer had been instructed to report all irregularities to the field supervisor, she reported this one. The supervisor ruled that this was no longer a family according to the accepted definition and, further, that the housewife had more than she could handle already.

Anyone who has done work in the field knows about the almost mad desire on the part of interviewers to find short cuts. The presence of the supervisor tends to curb this practice. The supervisor also collects the data from the interviewers and is therefore in a position to call any existing misunderstandings to their attention and to clear them up so that useless data will not be gathered in the future.

The most important unit of any consumer survey is the interviewer. The general practice has been to belittle the importance of the interviewer and to assume that adequate questionnaires can take the place of good interviewers. This is not true. Really good interviewers have fewer refusals—some even receive luncheon invitations from the housewives! The poor interviewer finds a greater percentage of people refusing to continue the survey; she also has a high percentage of "not-at-homes" which cannot be explained by the laws of chance.

The only correct way to carry on an interviewing project is to have a full-time permanent staff and to pay them adequately. The $1.00-an-hour rate—or the payment of so much per respondent—encourages applications from a large number of part-time or temporary people who are not concerned with the problem and feel entirely divorced from any of the needs of the survey. If a survey is worth conducting, it should be done in the best possible manner; and this demands that, despite the increase in the costs, a full-time permanent corps of interviewers should be included on the staff. If the particular agency is not able to keep its interviewers constantly in the field, they should be assigned to analyzing data. High-grade interviewers are equipped to do this—and often in a much more meaningful way, since they have the advantage of their field experience.

### THE INTERVIEW

Since a relationship exists between market research interviews and those held for other purposes, the reader is referred to the discussion of interviews in Chapters 2 and 4, for it applies to consumer research interviews.

### ANALYSIS OF DATA

Whether the amount of information gathered in the survey is large or small, it must be analyzed. For large amounts of data, analysis by machines is often most economical. For short surveys, or for surveys involving limited numbers of subjects, hand tallying is often preferable.

Whether machines or clerks are used, nothing can take the place of

brains. A code must be devised which will include all types of answers, and it must be constructed in such a way as to allow a statistician readily to determine whether relationships exist between various parts of the data which have been gathered. Questions which depend on the answers to preceding questions must be tallied in that relationship. The most important principle in the analysis of data is that each item must be broken down into its most minute parts. Only after examining them in this infinitesimal form can the statistician properly begin to combine and integrate. If this step is not taken, he often loses sight of some meaningful relationships which do exist but have not been teased out of the data.

### REPORT PRESENTATION

Consumer surveys are eventually presented to top management. Although people in this group usually feel that they are too busy to read reports, they expect any report to have pictures and graphs and, most important of all, to be preceded by a one-page summary. They usually express pleasure at receiving the report on time, read the summary, look at the pictures, and refer it to one or more subordinates for careful study. To the extent that these subordinates consider themselves top management, they in turn do the same.

Students of market research must therefore be very careful in presenting reports. A scholarly and scientific work which is hundreds of pages long and thoroughly accurate is often treated unfairly as the product of a "long-haired philosopher." The form of a good consumer research report as dictated by top management is:

1. Summary.
2. The problem.
3. Sample.
4. Method.
5. Results.
6. Conclusions.

As stated previously, the summary must be brief. It is frequently advisable to have a journalist rather than a scientist write it, because the scientific writer often does not have the punch which the executive demands.

The problem should contain a clear statement of the purpose of the research. It is best handled in a paragraph or two, when possible.

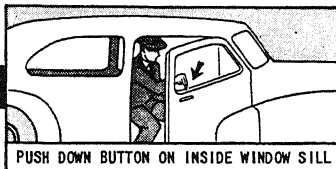
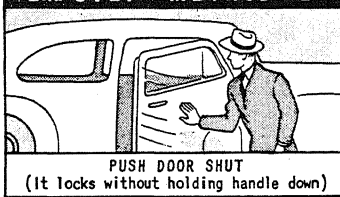
The description of the sample should include not only the exact number

# What is YOUR preference on this "Tremendous Trifle"?



## —LOCKING AUTOMOBILE DOORS FROM THE OUTSIDE

In many of the late model cars, the doors may be locked from the outside without the use of a key.

Here are two ways of doing it, and we'd like to know which you prefer:

PROS & CONS -Method "A"

Holding the door handle down is an additional operation.

But it serves as an extra reminder against *"locking yourself out"* --i.e., accidentally locking your car with the keys left inside.

(Method A is now used on General Motors cars)

PROS & CONS -Method "B"

Makes it easier when you are carrying a lot of bundles —but it does increase the chance of *"locking yourself out."*

However, there are those who feel that the act of pressing the button on window sill should be sufficient reminder.

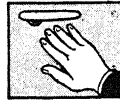



*Figure 18.2.* Tremendous Trifle. (By permission of The Customer Research Staff of General Motors.)

WHILE WE'RE ON THIS SUBJECT —we'd also like to get your answers to the following questions which will be helpful to us in our analysis:

About how often do you have occasion to lock your car doors from the outside?

- ☐ Several times a day
- ☐ Twice a day
- ☐ Once a day
- ☐ 2 or 3 times a week
- ☐ Very seldom
- ☐ Never lock them

Do you often have to lock your car doors while carrying a small child, or parcels, packages, etc., making it inconvenient for you to turn the key or hold down the handle to lock your car?

☐ Frequently ☐ Once in a while ☐ Hardly ever

Have you ever had the bad luck to lock yourself out of a car?

☐ YES ☐ NO

If you answered "yes" above, on what make and year model of car did it happen?..........

Any comments or remarks on any of the points covered in this questionnaire?

..........

..........

..........

..........

..........

..........

There will be NO SALES FOLLOW UP —but just to help us in our statistical compilations would you mind giving us the following information?

Your Approx. Age .......... ☐ Male ☐ Female Make of Car now owned .......... Year model ..........

**Thanks for your cooperation**

SERIES S-108

Please return in enclosed envelope to

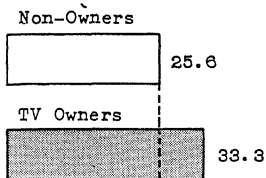
CUSTOMER RESEARCH STAFF GM GENERAL MOTORS, DETROIT

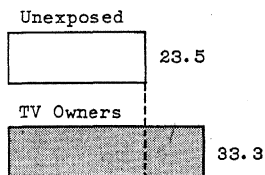
*Figure 18.3.* While We're on This Subject—(By permission of The Customer Research Staff of General Motors.)

of people studied, but also their outstanding characteristics, such as geographic distribution, age, economic status, educational level, and any other factors which are relevant to the conclusions.

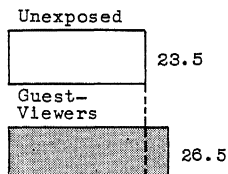
The method should describe exactly how the data were gathered. Scientific research demands a clear description of the method so that it can

## Recapitulation of Major Findings

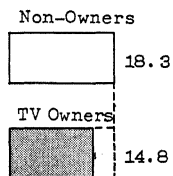
From the rather intricate series of figures which have been presented in this report it is well to single out a few as summing up the major findings. The following are the figures which best represent these highlights. All are based on the "percent of group buying brand in past month", Survey II.

### 1 – TV Owners vs. Non-Owners

The average TV-advertised brand (average of the 17 studied) was bought during the past month by *25.6% of the non-owners vs. 33.3% of the TV owners.*

### 2 – TV Owners vs. Persons Unexposed to TV

Since two-thirds of the non-owners are themselves exposed to television, a purer measure of television's effectiveness is the comparison of *TV owners (average: 33.3%) with non-owners unexposed to TV (average: 23.5%).*

The difference amounts to 9.8% or 98 more buyers among a thousand owners (relative increase: 41.7%)

### 3 – Guest-Viewer Buying

The sales effects due to exposure to television among non-owners are indicated by comparing the *guest-viewers (average: 26.5%) with the unexposed non-owners (average: 23.5%).*

The difference of 3.0% represents 30 extra buyers per thousand guest-viewers (relative increase 12.8%).

### 4 – Brands Not Advertised on TV

Brands not advertised on television show a decrease from their "normal" sales level of *18.3% (average among non-owners) to a level of 14.8% among TV owners.* (Average of the 13 brands studied.)

The 3.5% difference represents 35 "lost" customers per thousand TV owners (relative decrease: 19.1%).

*Figure 18.4.* Recapitulation of Major Findings. (From T. E. Coffin, *The Hofstra Study: A Measure of the Sales Effectiveness of TV Advertising,* 1950. By permission of Thomas E. Coffin, National Broadcasting Company.)

be duplicated and verified. With consumer research coming to be regarded more as big business than as science, the tendency has been to keep the particular method used a secret. From the business point of view this is defensible, but from the scientific point of view it is reprehensible. There is no such thing as a secret scientific method; anyone who thinks he has one is probably suffering from a delusion.

The result should be presented in clear and concise form. This is where the artist comes in, for only the most primitive studies now rely solely on

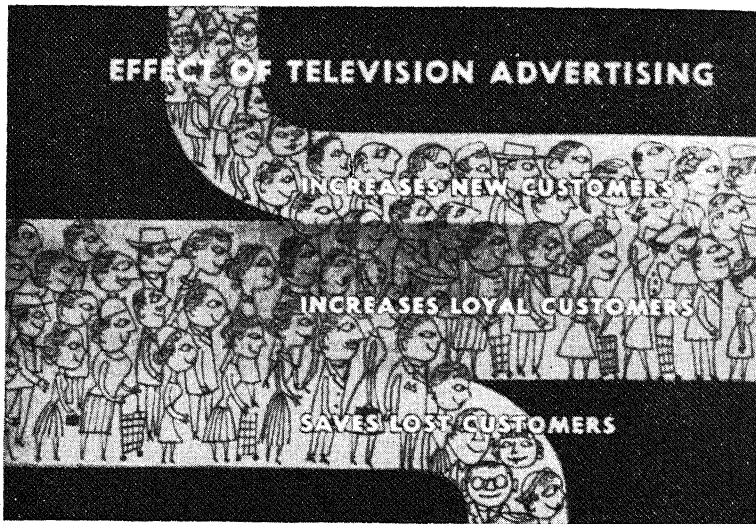



*Figure 18.5.* Effect of Television on Advertising. (From *Why Sales Come in Curves.* By permission of Thomas E. Coffin, National Broadcasting Company.)

tables. Graphs and pictures are as much a part of consumer research reports as "Superman" and "Mickey Mouse" are a part of our national culture.

The conclusions must be brief but can justifiably be more technical than the summary which precedes the entire report.

Some examples of questionnaires and reports are shown in Figures 18.2–18.5.

PAYMENT OF RESPONDENTS

The discussion of fees for respondents is often regarded as virtual heresy. It seems to be axiomatic that everyone connected with consumer

research will be paid some fee with the exception of the person who gives the information. There is a general objection that respondents cannot be paid because it will cost too much. A further objection claims that paying respondents will attract only people who are interested in the money they will receive. Both of these objections lack validity.

Payment, even a token consideration, assures the continued interest of the respondent, especially on longer surveys. In Blum and Candee's field study (*4*) data were gathered from 101 families and each family spent from five to seven hours giving information to the interviewers. These families were told that at the conclusion of the survey they would be given $5.00 in war savings stamps. Despite the ordeal of this long and involved investigation, only about 5 percent of the families dropped out. It is safe to say that this dropout rate would have been much higher if it had not been for the $5.00 token payment. Since this amount of money is not large, it is unlikely that these families were "working for" the interviewers. However, the novelty of being interviewed does wear off and people are likely soon to regard the interviewers as invading their individual rights. If the giving of information is tempered with a fee, the poll can be regarded as having a businesslike basis, which, in fact, it has.

## Behavioral Studies

Most research in the field of consumer investigations tends to measure attitude and opinion, as the material reported in this chapter illustrates. Since it is easier to ask questions than to measure behavior this should be readily understandable. The question as to whether people behave in the manner indicated by their verbal assumptions is a moot one. Sometimes they do but sometimes they do not.

A sound principle to follow in this field is to measure behavior rather than attitude and never assume that attitude means behavior. As Politz points out, the question "What brand of refrigerator will you buy next?" has for a decade produced more votes for General Electric than for Frigidaire. The only difficulty is that Frigidaire sells more refrigerators (*18*).

Psychologists have made studies of consumer behavior as directed toward beer, cigarettes, shaving cream, ice cream, soft drinks, and other consumer products. Brief references to some of these studies will be made mainly to encourage more studies along the same lines and also to clearly emphasize that consumer preferences ought to be established behaviorally and not attitudinally.

Fleishman (*8*), using a panel technique, supplied 20 families with

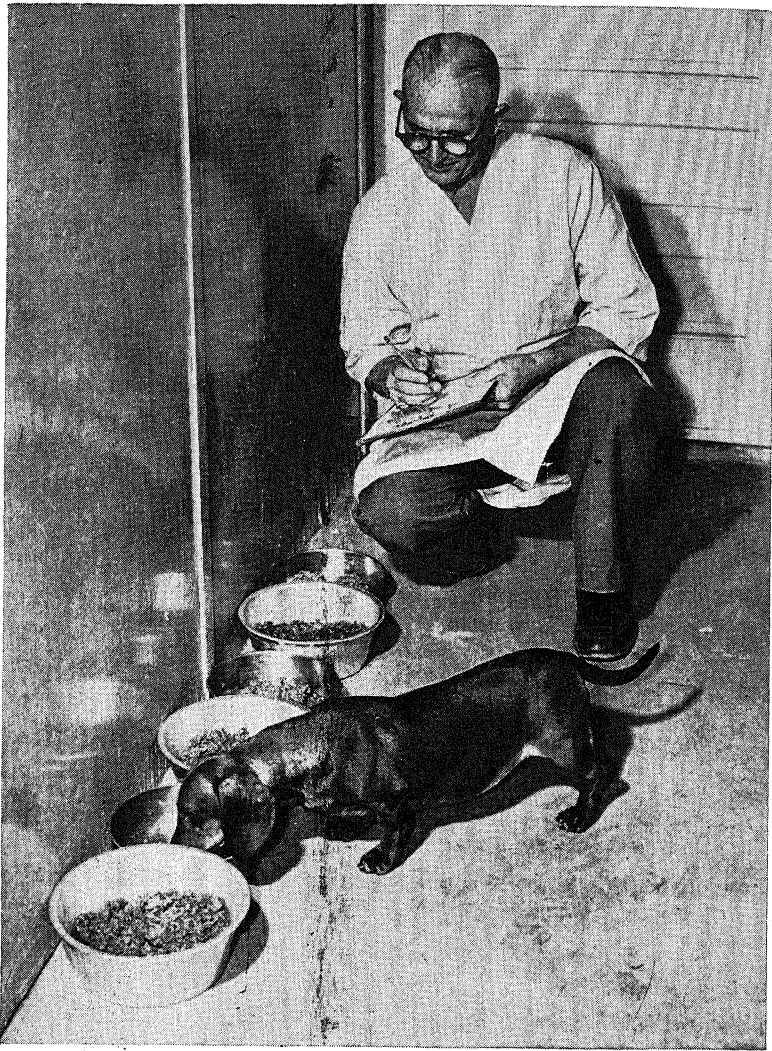



*Figure 18.6.* Behavioral Studies May be More Meaningful Than Attitude Studies. (Courtesy of The Quaker Oats Company.)

eight bottles of each of six different brands of beer for seven days. The bottles contained no labels or brand names. Each brand was identifiable by a differently colored bottle top but these colors did not identify the same brand each day. Thus the consumers were required to make an independent decision of beer preference each day. The results indicated that there were real differences in beer preferences.

A further analysis of the results revealed that brands A, B, and C were

preferred to brands E and F. Brand A previous drinkers preferred brand A 56.3 percent of the time, but brand B previous drinkers preferred brand B only 26.3 percent of the time. Brands A and B were consumed and liked about equally during the course of the experiment. The quality that makes brand A drinkers more likely to form preferences for their old brand when the name was not known when compared with brand B poses an interesting problem. At this point, a logical question would seem to be, "Do the A drinkers prefer the taste while the B drinkers prefer the advertising?" Bigger and better beer drinking experiments seem to be indicated.

Fleishman (*7*) also conducted an experiment in which 10 volunteer subjects smoked 2517 free cigarettes over a two-week period. Each morning each subject received a supply of six brands identifiable only by a colored band. Each day brand and color were changed for the first week but not for the second week. At the end of the day the subjects returned unsmoked cigarettes and butts so an accurate count could be kept.

The cigarette smoked most often by the group was the lowest-priced cigarette. The four popular brands were smoked about equally and the most expensive brand was significantly avoided by the group. Each day a shift in preferred and avoided brands occurred. No subject whose usual brand was included in the experiment smoked his brand most often during either week or for the total experiment, and subjects smoking their own brand during the study frequently expressed dislike for that brand.

Brand identification did not occur among either own-brand smokers or non-brand smokers. After the experiment was concluded, the subjects were told the brand names included and something of the results. Later a check was conducted and all subjects had reverted to the brand preferences prior to the experiment. This very well emphasizes the vagaries of attitude versus behavior in consumer studies.

Schlosberg (*25*) attempted to determine whether preferences existed among five brands of shaving cream. A trained barber shaved a group of subjects using a standard cream on one side of the face and varying the comparison creams on the other side. The shaving was standardized as to cream weight, water, etc. Each of the 10 subjects was shaved 20 times so that standard was compared with each of the creams four times and an actual preference for one of the creams was established. Schlossberg writes, "The chemists of the sponsoring company laughed at the possibility of any real differences between the shaving creams, for they knew the formulae from which they were made. The managerial end of the firm, perhaps sold by their own advertising, initiated this research."

A consumer test was taken to determine ice cream preferences (*1*). The

method used was that of paired comparisons. Each of four ice creams was compared with every other; two were French ice creams, i.e., with egg content, and two were domestic ice creams, i.e., with no egg content. Each type differed as to butter-fat content but the low-butter-fat French was approximately equal to the high-butter-fat domestic. Experimental design neutralized the effects of position and serial order.

Taste tests established the following preference order: French low butter fat, French high butter fat, domestic low butter fat, and domestic high butter fat. An interesting point is that the subjects were asked to state their preferences in an interview and 51 percent stated a preference for French, 22 percent for domestic; and 27 percent stated no preference. However, all three groups in the taste test preferred the French cream. This illustrates the point that some stated preferences may agree with behavior but some do not. It follows that a researcher must know which is which. Another qualitative result was the finding that the most usually ascribed reason for liking an ice cream was "creamier" and this word was used regardless of the specific ice cream chosen.

A series of four studies was performed on the identification of cola beverages. In the first study Coca-Cola, Pepsi-Cola, Royal Crown, and Vess Cola were given to a group of subjects and they were asked to identify the brand. The results indicated that the subjects did not discriminate the four brands on a gustatory basis. The second experiment used only the first three named brands and the subjects when asked to discriminate and identify cola drinks could do no better than if they had drawn the names out of a hat. The third study used three little-known cola brands and found no correct identifications but rather the beverages were identified as the three popular brands. In the three studies using seven brands the results indicate that identification, regardless of brand, tends to always be in the order of Coca-Cola, Pepsi-Cola and Royal Crown Cola.

A fourth and final study was performed in which the subjects were told the names of the three colas to be identified. In part 1 of the study all three were given but in part 2 each subject got three samples of the same cola. In part 1 correct identification occurred as follows: 54 percent for Coca-Cola, 43 percent for Pepsi-Cola, and 45 percent for Royal Crown Cola, and only Coca-Cola was identified with a frequency statistically different from chance. Pronko and his co-workers (*19, 20, 21, 22*) illustrate that results may be a function of experimental design as well as the fact that cola drinks in the main are "equivalent stimuli" at least as far as correct identification is concerned.

The common characteristic of these behavioral studies is that they are based upon experimentation. Procedures are painstakingly and minutely described. Conclusions are limited to the data gathered and are drawn based upon the variable investigated. Rigid attempts are made to neutralize or hold constant factors which might otherwise affect the results. It would seem that the greatest contribution of the psychologist to the field of consumer research is experimentation.

### Economics and Psychology

Katona presents the thesis that economic behavior stems from human behavior and that there is a need for psychology in economics (*13*). He believes that studying the motives, attitude, and expectation of consumers and businessmen contributes to the understanding of spending, saving, and investing. Katona therefore proposes that conceptual and methodological tools of psychology be used to investigate economic behavior. Such psychoeconomic studies supplement the traditional analysis of supply, demand, income, and consumption. To a large extent Katona is using the knowledge of psychology applied to consumer research in the realm of economics. His is clearly an attempt to broaden the scope of the field of consumer research.

Much of the work that Katona has done in this field has been at the Survey Research Center of the University of Michigan. Asking people why they did or did not act in a certain way and asking how they feel about expenditures or about savings is a method of studying motivation as well as economic behavior. By interrelating the behavior, the feelings and characteristics of the persons involved, and the specific circumstances in time, one can meaningfully understand events and predict future events. The important point is gathering indirect evidence through cross tabulation of data rather than merely analyzing a situation in a comfortable armchair without having any data to analyze.

Katona cites many studies but one will suffice by way of illustration. Table 18.1 compares actual and intended behavior in the purchase of automobiles.

In order to predict behavior one must know not only intention but those characteristics which may or may not change the intention. The program studies a variety of economic topics and concludes that one must accept both psychological and economic factors to explain inflationary price increases. Either one, alone, is incomplete.

Forecasts of business trends will be made more accurate by offering a

Table 18.1. Realization of Expressed Intentions to Buy New Automobiles

| Actual Behavior (determined early in 1949) | Expected to Buy New Cars in 1948,[a] Percent (determined early in 1948) |
|---|---|
| Did buy new cars in 1948 | 52 |
| Did buy used cars in 1948 | 10 |
| Did not buy cars in 1948: | |
| Postponed purchase[b] | 12 |
| Explained change in plan[c] | 6 |
| Unaccounted | 20 |
| Total | 100 |

[a] Respondents said either that they definitely expected to buy new cars in 1948 or that they probably would; when only those who expressed definite intentions to buy are tabulated, the rate of realization of intentions is somewhat higher.

[b] Respondents said in early 1949 that they definitely would buy new cars in 1949; there was still a shortage of automobiles in 1948, which may have accounted both for postponement of purchase plans and for buying used cars instead of new ones.

[c] Referred in early 1949 to income or price developments which made for a change in plans.

Note: Spending units interviewed both early in 1948 and early in 1949. These units represent a random sample of urban spending units included in the 1948 Survey of Consumer Finances who did not move in 1948. The analysis of the interviews was made possible by a grant of the Rockefeller Foundation to the University of Michigan.

Table 18.1 is reprinted by permission from *Psychological Analysis of Economic Behavior*, by G. E. Katona. Copyright, 1951, McGraw-Hill Book Company, Inc.

comprehensive theory consisting of verified sets of functional relationships between all relevant economic and psychological variables and by including knowledge on the way the different sectors of the economy interact.

The approach is very interesting. It is more than an attempt to promote an inter-discipline. It uses the methods of consumer research with a sound knowledge of psychological principles in the realm of economics.

## Summary

Consumer research has many uses in industry and in such related areas as the research, marketing, advertising, and selling of a product. However, the field is susceptible to abuses and care must be taken in determining the worth of the studies.

The field also includes polls to predict political contests and to measure

attitudes on public issues. Among the various organizations that conduct consumer polls are syndicated agencies, advertising agencies, magazine publications, manufacturing companies, government agencies, and educational institutions.

Consumer research requires a careful statement of the problem. There are at least four different methods of securing data, and for most purposes the interview is the most valid. However, this method requires trained personnel under constant field supervision. The sample of the population on which the study is based is obtained by either random or stratified sampling. Stratification prevents bias, provided the characteristics of the total population are known. Large samples are no longer necessary for valid results. A questionnaire is difficult to construct and requires pretesting in the field. The data secured must be subjected to minute analysis and all possible interrelations of items must be inspected.

The report resulting from a consumer survey has a typical format. It should be preceded by a brief summary and include pictorial presentation of the data.

Behavioral studies should be emphasized, in contrast to present assumptions that attitudes correctly reflect consumer preferences. Studies on beer, cigarettes, shaving cream, soft drinks, and ice cream are valuable in survey as models for experimentation.

The attempted integration of economics and psychology via the medium of consumer research demands attention and further work. It is likely to lead to meaningful conclusions.

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# CHAPTER 19

# Advertising

**PSYCHOLOGY** can be an aid in effective advertising. Advertising, through suggestion, attempts to make people actually think in accordance with the advertiser's desires. Psychology studies the motivation, attention, interests, and behavior characteristics of people. The overlapping of subject matter in the two fields is evident, and the relationship between advertising and psychology is therefore close. The main value of psychology in advertising is its scientific methodology in offering a research technique to advertising.

It must be made plain that advertising men are not necessarily psychologists. However, many psychologists are employed by advertising agencies. When a psychologist works in such a capacity, it is usually as a researcher.

At McCann-Erickson (3) the research division engages primarily in four types of activities—market research, copy research, radio research, and econometric and media research. In addition, a program of basic research is included which involves lengthy studies planned to benefit the agency rather than work performed for specific clients.

Wallace H. Wulfeck (35) describes the varied nature of the work a psychologist is likely to do in an advertising agency. The research people in an agency are chiefly concerned with advising on the most effective way to present the values of a given product so that the advertising message will best penetrate the mind of the consumer. To this end the psychologist consults with various technical specialists in the advertising field. He also conducts consumer surveys to determine the acceptance or rejection of the products advertised, and to gain other information about consumer attitudes. In addition, he is expected to do much library research, analyze sales and distribution data, and document various claims.

The types of research projects conducted by an advertising agency vary tremendously. For example, in order to reach a feminine audience, a study may require investigation of biological, sociological, anthropological, and psychological fields to establish a factual basis on which to build an advertising campaign. An illustration is the specific investigation which required a knowledge of sexual attitudes, methods, prejudices, and taboos of women belonging to various religious groups and subcultures, in order to understand the motives against the use of tampons for menstrual protection. Such information can result in the advertising appeals which will combat resistance most successfully.

Copy often results in the use of clichés, stock phrases, and much hack writing under the guise of originality. Ample proof of this statement is furnished in Table 19.1. The frequency of stock expressions would indicate that all is not new, extra, or wonderful.

Copy testing as well as evaluating the advertisement as a whole are often included in the psychologist's work. Copy tests are made both before and after the appearance of the advertisement. Various methods have been developed to conduct them, including consumer juries, consumer polls, coupon returns, and readership study surveys.

A psychologist in an advertising agency may also be expected to discover new product uses. This is done through consumer polling and through testing the product on controlled samples of a population. He is also expected to conduct studies on package design and recommend desirable features of various kinds of packages.

From the varied nature of the research that the psychologist may be called upon to do in an advertising agency, it is obvious that the major concern is not whether the research is of an extremely psychological nature as much as whether he is using scientific methodology to solve the problem confronting the agency.

It is, of course, essential that the psychologist doing research in this field never sacrifice his scientific standards. Some people, because of the pressure of commercialism, would like to have "directed" research performed; they urge that research results should be directed and slanted to conform with conclusions that are in the best economic interests of the firm. Such research is worse than tainted—it is a disgrace. Although no particular agency is suspected of conducting "directed" research, the idea of its being performed is not too remote in a highly competitive field. The point to be stressed is that research should not be a dishonest excuse for aiding business; rather, it must be honest and independent and thus directly or

Table 19.1. Frequency of Stock Expressions in National Magazine Ad Copy (34)
(Based on analysis of 60,000 words of current advertising copy)

| | Frequency per 10,000 Words |
|---|---|
| **Floating Comparative** | |
| More, faster, longer-lasting, etc., without referent | 21. |
| **Anti-Competition** | |
| America's world's greatest, fastest, etc. | 12. |
| Exclusive, first, special, leading, etc. | 9.6 |
| Only . . . offers, gives, does, etc. | 6.8 |
| Does more, better, twice as . . . etc., than | 6.8 |
| Greatest, best, finest, etc. | 5.8 |
| More people, doctors, etc., use . . . than, | 4.5 |
| No other . . . offers such, etc. | 3.1 |
| **Announcement** | |
| New! | 28. |
| No more messy hands, bending, etc. | 10.3 |
| Amazing! Sensational! Revolutionary! Miracle! | 6.6 |
| Now! At Last! | 4.6 |
| Never before! | 2. |
| **Proof Positive** | |
| Tests prove, doctors recommend, etc. | 4.3 |
| Scientifically tested, medically proven, etc. | 3.6 |
| Special, tested ingredients, etc. | 2.1 |
| **Stock Appeals** | |
| Extra, plus | 9.3 |
| Look, buy, try, write for today | 7.3 |
| Free (i.e. for the reader) | 4. |
| Easy-to-use, take, apply, etc. | 3.8 |
| Quick, satisfying, etc., relief | 3. |
| Comfort | 2.8 |
| Free (from something bad, e.g., dirt-free) | 2.3 |
| **Key Adjectives** | |
| Easy | 10. |
| Wonderful | 7.3 |
| Safe | 5. |
| Famous | 5. |
| Clean | 5. |
| Beautiful | 4.1 |
| Smooth | 4. |
| Delicious | 3.5 |
| Mild | 3.1 |
| Natural | 2.5 |
| Magic, magical | 2.1 |
| Pure | 2.1 |
| Gentle | 2. |

indirectly aid business by making positive and in some cases negative recommendations.

A psychologist may enter the field without being at all concerned about the advantages and disadvantages of advertising as a business. Many people praise advertising to the skies and insist that it results in better products at lower costs. Others insist with equal vigor that advertising is a parasite feeding on industry and that it dishonestly promotes business through wild exaggeration and false claims. Actually, advertising has demonstrated its usefulness; it is neither the angel some claim it is nor the devil it is often painted to be. Anyone who has a strong feeling about the "viciousness" of advertising will never be happy in it. In many respects, it is a typical business—no better, no worse.

Sometimes, in the advertising field as in others, there is conflict between the psychologist and the executive. For example, the sales manager in advertising likes to have the ammunition that research can provide, but he may feel that the psychologist has been much too conservative in his interpretation of the data. He believes that they should be interpreted primarily in the light of his sales problems and that research should act only as a very subordinate aid. This conflict is not necessary. The president[1] of one large corporation whose primary concern is advertising happens to be a research psychologist. Obviously, to occupy such a position successfully, he cannot consider the research to be primary and all other aspects of advertising secondary; he must find the happy balance between these two extremes.

## All Advertising Is Not Psychology

There is much information and material to be gathered in an advertising agency, much work to be done that is not psychological in nature. For these jobs a psychologist, as such, is not qualified. For example, an important part of an advertisement is the copy. A psychologist does not necessarily know how to write copy; the best he can do is to test it after it is written. He may learn how to write it, but he will then be a copy writer rather than a psychologist. An important technical aspect of advertising is layout. The psychologist may be able to advise a layout man regarding the various factors which attract attention, but the fact that he is a psychologist does not mean that he is able to design a good layout.

[1] Dr. Frank Stanton, president of the Columbia Broadcasting System, formerly research director of the company, and, prior to that, instructor in psychology in a midwestern university.

The art work and photography which play an important role in advertising are specialized and technical, and are best handled by experts in those fields. Selling the client on his need to advertise and arranging for handling the account are straight business. The psychologist is not necessarily a good salesman.

Many members of the advertising profession insist that their work is always done under pressure and considerable tension. Few fields are supposed to be more productive of ulcers than this one. The need to meet deadlines is always present, and the pressure is vastly different from that generally encountered by the individual doing academic research. Production problems must be handled, and it is rare that the psychologist, on the basis of his background and training, knows how to deal with them.

### Motivation and Advertising

In advertising, the purpose is to motivate the consumer to use the product being advertised. Since psychology studies motivation, psychologists can be of help to the advertiser. Much nonsensical material has been presented on motivation in relation to advertising. Earlier, advertisers underestimated the complexity of human motivation; they demanded simple lists of motives which would solve their problems. This is why the ill-fated "instinct concept" caught on in advertising the way it did. For a while the slogan in every advertising agency might have been "A good ad touches an instinct." Most present-day psychologists do not accept instincts as an explanation of human behavior.

More recently, the vogue on "Madison Avenue" (the term usually applied to advertising because so many agencies have offices on this New York street) has shifted. All is now motivation research.

For the past twenty-five years or more, the approach to motivation in advertising has been through the simple expedient of considering a list. Such an approach is not too meaningful. An individual never responds to one single motive; rather he makes a selection based on the myriad of motives acting on him at the same time. C. N. Allen has compiled such a list (*1*). However, he does not regard it with the same religious fervor shown by the compilers of other such lists. Allen drew up this list merely because a more or less arbitrary catalogue of motives can be useful to an advertiser. He maintains that such a list is useful as an arbitrary and rough approximation in describing customers in general, but he recognizes that every individual is always unique and hence does not exactly con-

indirectly aid business by making positive and in some cases negative recommendations.

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[1] Dr. Frank Stanton, president of the Columbia Broadcasting System, formerly research director of the company, and, prior to that, instructor in psychology in a midwestern university.

The art work and photography which play an important role in advertising are specialized and technical, and are best handled by experts in those fields. Selling the client on his need to advertise and arranging for handling the account are straight business. The psychologist is not necessarily a good salesman.

Many members of the advertising profession insist that their work is always done under pressure and considerable tension. Few fields are supposed to be more productive of ulcers than this one. The need to meet deadlines is always present, and the pressure is vastly different from that generally encountered by the individual doing academic research. Production problems must be handled, and it is rare that the psychologist, on the basis of his background and training, knows how to deal with them.

### Motivation and Advertising

In advertising, the purpose is to motivate the consumer to use the product being advertised. Since psychology studies motivation, psychologists can be of help to the advertiser. Much nonsensical material has been presented on motivation in relation to advertising. Earlier, advertisers underestimated the complexity of human motivation; they demanded simple lists of motives which would solve their problems. This is why the ill-fated "instinct concept" caught on in advertising the way it did. For a while the slogan in every advertising agency might have been "A good ad touches an instinct." Most present-day psychologists do not accept instincts as an explanation of human behavior.

More recently, the vogue on "Madison Avenue" (the term usually applied to advertising because so many agencies have offices on this New York street) has shifted. All is now motivation research.

For the past twenty-five years or more, the approach to motivation in advertising has been through the simple expedient of considering a list. Such an approach is not too meaningful. An individual never responds to one single motive; rather he makes a selection based on the myriad of motives acting on him at the same time. C. N. Allen has compiled such a list (*1*). However, he does not regard it with the same religious fervor shown by the compilers of other such lists. Allen drew up this list merely because a more or less arbitrary catalogue of motives can be useful to an advertiser. He maintains that such a list is useful as an arbitrary and rough approximation in describing customers in general, but he recognizes that every individual is always unique and hence does not exactly con-

form to the generalities in the list. Although all such lists are artificial and sterile, Allen's list is presented merely by way of demonstrating the type of lists offered as keys to consumer motivation.

| Primary Wants | Appeals to Primary Wants |
|---|---|
| 1. Appetizing food | Enjoy tastes, smells, sights, nourishment of food. "Meat on the table." |
| 2. Thirst-quenching drinks | Enjoy tastes and other refreshing qualities. "The pause that Refreshes." |
| 3. Comfortable surroundings | Enjoyment of a better standard of living. "See the kitchen *Good Housekeeping* LIKES." |
| 4. Escape from pain and danger | Basis for all negative appeal; prevention and remedy. "Feel that Knot of Pain Fade Away." |
| 5. Sex companionship | Attractiveness to the other sex; romance. "Cigars Needn't Interfere With Kisses." |
| 6. Welfare of loved ones | The basis of insurance copy: NOBLESSE OBLIGE. "My Daddy's Smart." |
| 7. Social approval | Enjoy the admiration of others; prestige. "Now that's what I call good coffee." |
| 8. Superiority over others | Satisfaction in excelling, socially in most cases. "How to win friends and influence people." |
| 9. Mastery over obstacles | Satisfaction of ambitions; "will-to-power." "Are you flying blind?" |
| 10. Play | Basis for travel, sports, and hobbies copy. "Play Winter Sports in Winter Sportswear." |

| Secondary Wants | Appeals to Secondary Wants |
|---|---|
| 1. Universality | "Around the corner from everywhere." |
| 2. Health | "Join the Regulars with Kellogg's ALL BRAN." |
| 3. Efficiency | "More Free Time for Mothers." |
| 4. Convenience | "No Need to Shift or Use the Clutch." |
| 5. Dependability; quality | "Strong as the Rock of Gibraltar." |
| 6. Economy; profit | "Clipping this coupon saved him $17.92." |
| 7. Style; beauty | "Make your figure lovelier the easy way." |
| 8. Cleanliness | "Banish 'Tattle-Tale Gray.'" |
| 9. Curiosity | "What Can a Man Believe In?" |
| 10. Information; education | "What do you know about sheets?" |

More recently, such lists have taken a secondary role to motivation research. The major difficulty is that this concept is not clearly understood and there is disagreement on definition. Politz (23) states, "The problem

of motivation research is not just to find motives on the part of the consumers, but to find those motives which are controllable and likely to influence a purchase." To others it may mean exploring the "real" reason why a consumer buys or rejects a product or service. Still others search for the unconscious motives and draw heavily on principles and concepts of psychoanalysis. While it may be true that unconscious motives compel purchases, it is probably not true that a single interview for one or even two hours by interviewers not trained in the art of psychoanalysis can reach into depth.

In a spoofing article called "Adman's Nightmare: Is the Prune a Witch?" (5) a reference is made to a study by Dichter for the California Prune Advisory Board. After 200 interviews, among other things Dichter reports that prunes are symbols of old age; prunes are a scapegoat food; the prune is a witch. In addition, Dichter makes suggestions as to how advertisers can allay prejudice and sell more prunes. Among them are: prunes, the black diamonds of the fruit family; reassure the woman that it is perfectly acceptable to serve prunes and not to be ashamed because they are a cathartic.

It does appear that advertising is either allergic to or prone to accept psychology that most psychologists prefer to look upon with caution. Of course there is a better way—a way probably in between the sterility of lists and the machinations of fantasy. Until the pendulum swings toward center, the best comment seems to be: Oh prunes!

Although motivation is at the core of advertising, other psychological concepts nevertheless play a role. These additional factors will be briefly discussed.

One concept of psychology that is important in advertising is attention. Such characteristics of an advertisement as intensity of stimulus, size, color, movement, repetition, novelty, etc., are factors that attract attention. This is a well-known fact. A good advertisement is one which uses to the greatest advantage the various techniques for attracting attention. Novelty and contrast sometimes contribute to the attention value. An advertisement which takes advantage of the "set" of the individual will attract attention. A "set" is a predisposing factor to action. For example, the use of skywriting during the summer near a beach is more likely to be effective when the product being advertised is a sunburn lotion rather than a fur coat.

Another concept in psychology that is useful in advertising is interests and attitude. Advertising will be effective to the extent that the consumer

has a strong interest in the product prior to the appearance of the advertisement. A person who wants to buy a suit will have a greater interest in a suit advertisement than the person who is not in the market for a suit. On the other hand, frequent advertisements presenting one make of suit as the type worn by "men of distinction" may eventually create a favorable attitude toward that brand in the mind of the consumer. That particular make can become a status "symbol" to many who see the ads.

The core of all advertising is suggestion. Some advertisements are mild in this respect, suggesting rather subtly that you "try" the product. Others, however, are far from subtle. We frequently hear a radio announcer urge that we buy a carton of "Blub" immediately; in fact, run out *now* and get it—don't wait until tomorrow.

With the emphasis advertising now places upon research, advertising people have a tremendous desire to secure as much knowledge as possible about people's behavior in relation to their product. This has opened up the huge areas of consumer research discussed in the preceding chapter. Part of this knowledge concerns information about the consumer's socioeconomic status. There is a relationship between economy and such things as the neighborhood one lives in, educational background, number of radios owned by a family, and number and types of magazines subscribed to. Such knowledge is useful to the advertiser, who wants to reach the most people with the minimum of expense.

The most important contribution of psychology to the field of advertising has been the introduction of the scientific method, which enables conclusions to be based upon fact rather than biased opinion. To this end, the psychologist has shown considerable ingenuity in modifying techniques to suit the needs of this field. Research in advertising has helped to make advertising more effective. No longer is it necessary to be guided by rule of thumb in solving the various problems posed by potential advertisers. Instead of relying on one man's opinion, the researcher can present facts and figures based upon a known sample with known characteristics, and hence may be much more accurate in predicting the success or failure of the proposed program. Because of this, advertising has become slightly more conservative. Fewer false and unsubstantiated claims are made both to the person who pays the bill immediately—the sponsor of the campaign—and the consumer who pays it eventually. This is not to imply that advertising people are dishonest. However, they have been a little too enthusiastic and overconfident on occasion, for they

sometimes believe that their experience entitles them to predict future behavior accurately. Research in advertising has tended to modify this view, with notable and desirable effects.

### Various Methods of Measuring Advertising Effectiveness

Companies planning to spend $10,000, $100,000, or $1,000,000 on a sustained advertising campaign have learned to want some of the answers in advance. Even the man who is sold on advertising will want to know whether to put the entire amount in a radio, a magazine, or a newspaper campaign, or to allocate funds to each of these media. It is not unnatural to expect that a man who sells radio time believes that his medium is the most effective, or the man who sells space in a magazine believes that the magazine approach is the best.

Of course, the solution to this problem is not to adopt an arbitrary position but to obtain the answer as a result of research. Such information can be gained from data on measuring the effectiveness of advertising. Among the many methods devised to measure this are the jury method, split-run technique, recognition test, brand preference, recall test, and sales test, including coupon return. The consumer jury method tests the effectiveness of advertisements before they appear. In this method, a sample of the population with the same characteristics as those who will see the advertisement is polled, the idea being to establish which of several advertisements will most influence them to purchase the product. Since the advertising expert is often willing to acknowledge that he cannot tell in advance which appeal will most interest the consumer, this method is widely used. For that matter, the consumer cannot tell which advertisement is best from a technical point of view; but to the sponsor of the campaign, technical effectiveness is worth little if the advertisement does not appeal to the potential purchaser. In other words, the best ad is the one which the consumer likes, rather than one which the expert believes best.

Guest (*12*) conducted a survey on the difference between magazine votes obtained by coupon returns and the consumer-jury personal interview. He found that the responses to preferred advertisements differ when a person is asked to select the better of two advertisements and when he is asked to choose the one which interests him most. Guest believes that the latter question gives a truer picture of the respondent as a consumer.

Another method of testing advertisements is the split-run copy technique, in which two or more forms of a given advertisement are alternated

in different copies of a specific issue of a newspaper or magazine so that the various forms of the ad will be randomly distributed to the public. Thus two or more groups of the same population, equal in size as well as in various other characteristics, are subjected to the variable of a given form of the same ad. The relative pulling power of each form is measured by the number of replies received to an offer of a free sample or souvenir.

An example of a split-run copy test is reported by Manville (*19*), who attempted to determine the relative pulling power of the words "false teeth" vs. "dental plates" in the headline of an advertisement for a cleanser for artificial teeth. Two split-run tests were made in the New York *Times* Sunday Magazine Section by running advertisements, identical except for the change in the words in the headline, on the same day in the same space in different copies of the paper. "False teeth" yielded 51.4 percent replies, and "dental plates" 48.6 percent. Another split-run test was made at a later date, this time in the rotogravure section of the New York Sunday News. In this test "false teeth" yielded 52.5 percent replies, and "dental plates" again ran second with 47.5 percent. Apparently there is a slight difference in consumer preference for advertising carrying the words "false teeth" as opposed to "dental plates."

An important question in this technique, as well as in any other measure of advertising effectiveness, is how to interpret a small mathematical difference, that is, under what circumstances an obtained difference can be regarded as reliable or as negligible and attributed to chance factors. Zubin and Peatman (*36*) have proposed the use of a nomograph they have developed; it has great value in answering just such a question. When they applied the nomograph to Manville's data, they found that the differences recorded by him have no statistical significance. In other words, despite the slight mathematical difference in favor of "false teeth," these words cannot be judged as statistically superior to "dental plates."

Another means of gauging the effectiveness of advertising is to measure recognition of an advertisement that has appeared. In this method, a group of advertisements that the respondent could have seen and a group that he could not possibly have seen are presented to him in random order, and he is asked to identify all those he has seen. In other words, he has to recognize the familiar ones. The assumption here is that the advertisements that are recognized are better than the ones that have been seen but are not recognized. However, a peculiar error crops up in this method, for people claim to recognize advertisements that they could not have seen before; there is an error in identifying advertisements in the

recognition test. Lucas and Murphy have conducted a carefully controlled experiment (*18*) in which 100 advertisements were used. Fifty were from current issues of a magazine, and the other fifty were to appear in forthcoming issues of the same magazine. The authors found that 15 to 20 percent of the respondents "recognized" advertisements which they had not actually seen. Moreover, the percentage of error did not vary greatly with the size of the advertisement. The percentage of error on a full-page ad in black and white and also on a half-page ad was 20 percent; on a quarter-page it was 17 percent. Because of the wide variation in false identification of individual advertisements, the authors found it impossible to offer a general mathematical formula for correcting these errors. They conclude that the errors are due not to the respondent's attempt to mislead the interviewer or to faulty memory, but to the indifferent character of the advertisements themselves.

Advertising effectiveness is also measured by determining brand preference. According to Alfred C. Welch, one of the purposes of advertising is to establish an attitude favorable to the sponsor's particular brand of the product. Determining brand preference also tests the effectiveness of competitive advertising. A good way to study brand preference is to choose a product that has a number of brands all of which are equally accessible, similar in price, and otherwise indistinguishable with the possible exception of advertising. Welch made such a study (*32*) to determine the popularity of cigarette brands. He chose cigarettes because they meet the above qualifications. They are readily accessible and equal in price; furthermore, a number of independent studies have indicated that smokers cannot discriminate between any two popular brands of nonmentholated cigarettes. Anyone can conduct a carefully controlled blindfold test and establish findings similar to those reported by Husband and Godfrey in the *Journal of Applied Psychology* for 1934. Unpublished studies by the writer also established that the average smoker cannot differentiate among the popular brands.

The technique used by Welch was to ask his 322 subjects to name their favorite brands of cigarettes in order of preference. He found that 92 percent of them ranked first in preference the brands that they were smoking at the time, and that only 3 percent ranked these brands lower than second. Of interest in connection with this experiment is the fact that it was conducted at a time when Old Gold was sponsoring a contest to get people to buy Old Golds. During the contest, 10.3 percent of the smokers Welch tested were smoking Old Golds, but only 6.1 percent ranked this

brand first in preference. Consequently Welch made a follow-up study to determine what brands the contestants were smoking after the contest was ended. This study was conducted before the winners of the contest were announced, thus avoiding any emotional reaction in the respondents. He found that 6.2 percent of the respondents were smoking Old Golds. Welch interprets these data to mean that "brand preference" estimates preference more accurately than actual use, and he concludes that brand preference is more sensitive than a sales test in determining the results of advertising.

In another study (*31*), Welch analyzed the effectiveness of advertising in terms of four consumer attitudes—brand preference, brand familiarity, theme familiarity, and "theme credence."

Brand familiarity was determined by asking the subject to name five brands in response to a stimulus word, such as "cigarette" or "fountain pen." This differs slightly from brand preference in which the individual is asked to name brands in order of preference. Theme familiarity was estimated by asking the respondent to identify the sponsor of a particular advertising theme—for example, the sponsor of the theme "costlier tobacco" or "can't leak." In testing theme credence the respondent was asked a question to determine whether he believed the claim of the advertiser—for example, "What brand of cigarettes do you think uses the most expensive tobacco?" These four tests, according to Welch, make it possible to analyze an advertising campaign as to its effectiveness. Table 19.2 presents some of the findings.

Welch draws the conclusion that at the time of the analysis the Camel cigarette campaign was exerting only a slight effect on brand preference

Table 19.2. Summary of Test Results for Three Advertisements (31)

| | Advertisement | | |
|---|---|---|---|
| | Camel | Eversharp | Sheaffer |
| 1. Increase in brand preference | 3 | 6 | 0 |
| 2. Increase in brand familiarity | 4 | 19 | 2 |
| 3. Theme familiarity (% correct) | 47 | 56 | 36 |
| 4. Brand preference (correct) minus brand preference (incorrect) | 9 | 13 | 2 |
| 5. Theme credence (%) | 20 | 25 | 27 |
| 6. Association between theme familiarity and theme credence? | Yes | Yes | No |
| 7. Brand preference (believe) minus brand preference (not believe) | 14 | 27 | 20 |

and brand familiarity, but that theme familiarity had been established fairly well. According to him, the total pattern presents a picture of advertising that has obtained results by sheer weight of quantity rather than by individual effectiveness.

With reference to the Eversharp Pen campaign, the total pattern pictures advertising that is effectively raising the status of a brand from its previously low position. On the other hand the Sheaffer advertising was ineffective, primarily because it failed to convince people of the validity of its claim—"more for your money." The recommendation here was that either the claim must be presented more convincingly or a claim more capable of gaining acceptance must be used. The general plan of Welch's approach is to devise an analytic system of testing competitive advertising along clinical lines.

Another method of measuring the effectiveness of advertising is the use of recall. A commodity name is given and the respondent is asked to name any brand that he can recall. This is rather similar to the brand preference method but actually may be used more broadly. For example, after a person has seen a magazine, he may be asked to recall the advertisements in it, the assumption being that such retention is related to the effectiveness of the ad. After an order of recall has been established, the various advertisements can be analyzed to determine which factors in them had greater recall value. A further assumption is that recall is related to familiarity with the product advertised and also to ultimate use.

Ghiselli (*8*) used this method to determine knowledge of various trade names for an assorted group of commodities. He found that there is a high correlation between the percentage of first mention and the percentage of total mention; this finding is very similar to those reported by Hotchkiss and Franken as early as 1923. However, depending upon which index is used, the conclusions drawn as to popularity of brand will differ. Figure 19.1 shows that on the basis of the percentage of "first mention," one brand of fountain pen is apparently outstanding; but if the percentage of "total mention" is considered, there are two or possibly three outstanding brands.

Ghiselli's study illustrates the principle that interpretation of fact presentation is necessary regardless of the method used to determine advertising effectiveness and that, depending upon the scoring system used in a particular method, different conclusions can be reached honestly. This raises the question as to wherein lies the truth? At the present

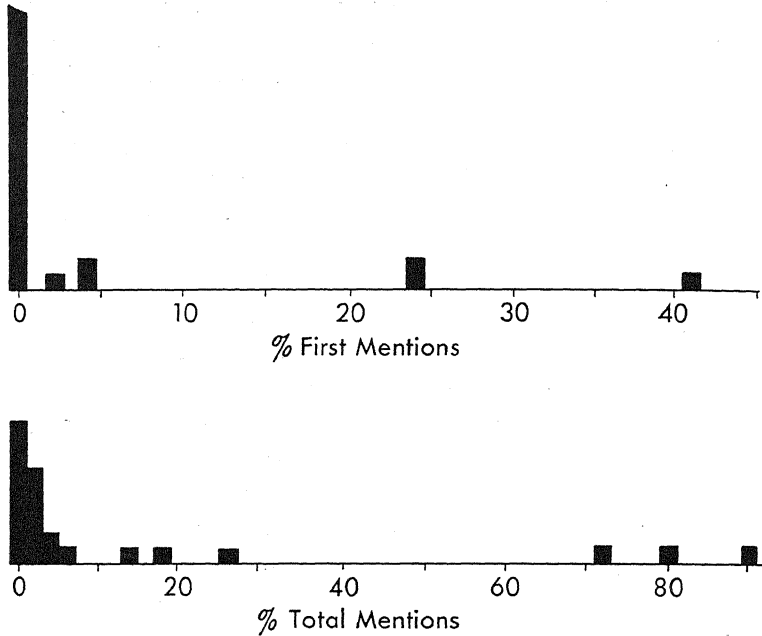



*Figure 19.1.* Trade Name Familiarity. (From E. E. Ghiselli, The measure of trade name familiarity, *J. Appl. Psychol.* [1941], *25*:97–100.)

time, only opinion allows us to judge which of the two indexes used by Ghiselli is more accurate.

We must critically examine the results of research just as we must examine allegation not based upon data. Some times people who cannot be called "brilliant" come to conclusions based on research which are less valid than those formulated by others on the basis of their subjective opinions. Research is no substitute for brains; research plus brains is a good combination.

Another method of measuring the effectiveness of advertising is the sales test. Here, differences in sales volume before and after the advertising campaign are attributed to the effectiveness of the advertising. For products manufactured on a large scale and distributed on a nation-wide basis, this method is often unreliable and requires too much time. Time lapses are often great between the sale of the product to the wholesaler, to the distributor, and finally to the retailer. Even if the advertising campaign is geared so that the retailer has the product when the advertisements appear, the lack of control of previous inventory and the time it takes for him to report back to the wholesaler contribute to making the

sales test unsatisfactory as a means of effectively measuring advertising.

In order to cut down on the time required for checking sales volume, gifts and premiums are often offered to the consumer if he will return a coupon from the advertisement. The coupons make measurement possible. In Welch's study (32) previously referred to, rather conclusive data were presented to indicate that sales soar to an abnormal height during a contest and drop considerably after the contest is over. This is not to say that contests do not have their place in advertising. There is no doubt that a person can make money by using such a technique, but it is extremely limited as a means of measuring the effectiveness of an advertisement. At best, it merely measures the effectiveness during a campaign. Obviously there is a vast difference between these two situations.

The coupon is often used to check the effectiveness of advertising; the keyed coupon makes it possible to compare the effectiveness of one magazine to another. In a survey called "Four Billion Inquiries," Rudolph reached the conclusion that the average advertisement draws a coupon response from one-tenth of 1 percent of the readers. The responses vary in direct proportion to the attractiveness of the offer. The most effective offer is a sample of the product and a recipe; this brings almost twice as many replies as the free recipe offer alone. The free sample ranks in between these two. Charging for the sample brings fewer rsponses than the free recipe, and charging for the recipe brings the fewest responses of all.

Studies which have been conducted show that a good number of the coupon clippers are repeaters and that people gather coupons to get as many free samples as possible. Others are habitual clippers and send for anything. Still others actually use the product and are taking advantage of this opportunity to get it free instead of paying for it. Children who do not receive sufficient quantities of mail often send in coupons so they too will get mail. The remainder of the population who mail coupons are those whom the advertisers are primarily interested in reaching, but they do not constitute too great a percentage of the total.

It is also known that there is a relationship between coupon returns and the weather. Coupon returns are lowest in December, when people are busy with Christmas gifts, and greatest in February when they have more time to stay home and send for samples.

An attempt to tie more closely the measure of advertising effectiveness and the psychological laboratory is illustrated by Eckstrand and Gilliland (6). They measured the psychogalvanic responses of subjects to series of advertisements in relation to the sales effectiveness of the ads. They con-

clude that the effectiveness of advertising material can be predicted by the psychogalvanic method since close agreement was found between galvanic changes produced by a series of pancake ads and their sales effectiveness. In a series of baby food ads with almost equal sales appeal, the galvanic responses were not differentiable. Golin and Lyerly (9) also measured these changes in skin resistance to an induced current by showing subjects a series of advertisements. They conclude that the galvanic skin response (known as P.G.R. or G.S.R.) is sensitive to differences in advertising layouts.

Britt (3) has proposed the categorization of methods to test advertising effectiveness. He proposes four methods, namely, opinion rating, concurrent rating methods, memory techniques, and the method of inquiry and sales.

Opinion ratings include pretesting ads using such rating systems as order of merit and paired comparison. Another example is the marking of an ad as one sees it in a magazine. Concurrent ratings include laboratory equipment such as the psychogalvanometer, the eye camera, and the tachistoscope, also observation and diary keeping. The memory technique measures recall and recognition, and the method of inquiry and sales investigates coupon returns via split runs and other such checks.

### Technical Problems of Advertising Studied by Psychologists

In addition to their attempts to measure the effectiveness of advertisements, psychologists have conducted useful research on such varied items as the effect of color in advertising, the use of illustrations, the value of trade names and trademarks, and characteristics of people who read ads. Kitson, Kaiserman, and more recently Klapp (*14*) have at various times studied the use of ilustrations in magazine advertising by means of the historical method. In this method, representative samples of advertisements are analyzed over a period of years, and trends are noted. Whereas pictures of people were used in 22 percent of all ads in 1900, they were used in 74 percent in 1940. The trend in using illustrations has been to depict people in functional relations to the commodity advertised. Klapp offers the hypothesis that this trend is valuable because such use of illustrations has imitation value; depicting a commodity as it is used, enjoyed, or recommended by an individual possibly causes other people to indulge in imitation. Figure 19.2 shows the trend in the use of illustrations for four periods during the years 1900 to 1940. The author is unaware of a

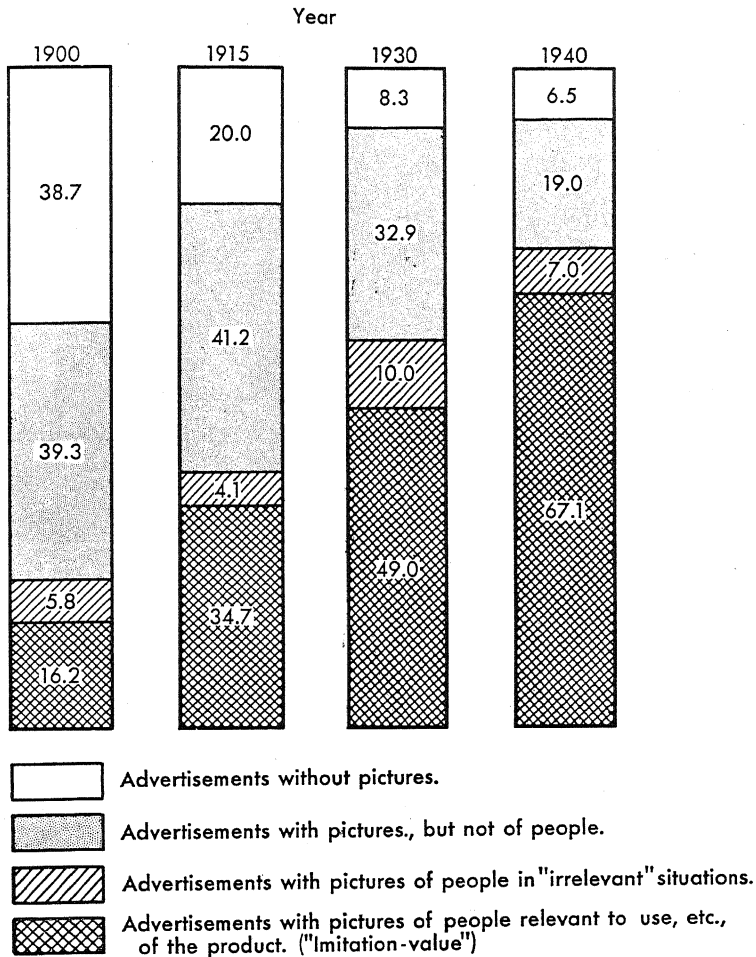



*Figure 19.2.* Trend in the Use of Illustrations. (From O. E. Klapp, Imitation value in advertising, *J. Appl. Psychol.* [1941], 25:243–250.)

more recent study that would indicate whether this trend has continued up to the present time.

Trade names have assumed such importance in advertised brands that some names are currently thought to be worth millions of dollars. The advertiser tries to find a trade name that people will readily recognize and recall, and he assumes that this leads to readier acceptance of the product. An interesting study was conducted by Jenkins (*13*) on the con-

fusion between trade names and generic names. It is commonplace knowledge that a trade name may be accepted by the public as a generic name for a whole class of articles; for example, Kodak, which is a trade name, is widely employed as a generic name for cameras. To test the extent of confusion between trade names and generic names, Jenkins surveyed two groups of college students. He found that there was no confusion as far as Kodak was concerned for these subjects knew it was a trade name, possibly because of the advertising slogan, "If it isn't an Eastman, it isn't a Kodak." On the other hand, more than two-thirds of these subjects incorrectly named dictaphone, mimeograph, and thermos bottle as generic names rather than the trade names they are. This suggests that advertising can be so effective as to defeat its own purpose unless particular attention is given to identifying trade names rather than the commodity itself.

Foley (7) used a modification of the free association technique, in which the subject says the first word that comes to his mind, in studying the value of trade names. He gave the stimulus word "Pepsi-Cola" to college students, and each subject wrote down a response. For two other experimental groups the stimulus words were "Coca-Cola" and "Dixie-Cola." The most common response to Pepsi-Cola and Coca-Cola was the word "drink"; but the most common response to Dixie-Cola was "Coca-Cola." Foley found that there were more Coca-Cola responses to the other "colas" than there were other cola responses to "Coca-Cola"; this can be interpreted to mean that the subjects tend to think of Coca-Cola when they hear the name of another cola product. Among the specific responses, the word "thirst" occurred only twice, but not in response to the stimulus "Coca-Cola," even though the advertising slogan of this product is "Thirst knows no season." One free association response was the word "awful."

The trademark tends to identify the product with a familiar picture or design. To aid this identification, the trade name is frequently combined with the trademark. In a study of which characteristics of trademarks produce greater familiarity with the product, Wetteroth (33) took black-and-white photos of various trademarks for such industries as automobiles, cigarettes, tobaccos, and breakfast foods. He asked a group of subjects to identify the products from these pictures. The leader, or the most widely recognized trademark, in automobiles was "Pontiac"; in tobaccos it was "Raleigh"; in cigarettes it was "Camels"; and in the breakfast foods it was "Aunt Jemima." The characteristic which seems to be outstanding

in each of these leaders is that the name of the brand can readily be depicted by the trademark. Pontiac uses an Indian head, Camel the picture of a camel; Sir Walter Raleigh and Aunt Jemima are the names of the characters shown. This shows the value of having a direct tie-in between brand name and trademark.

It is a well-known axiom in advertising that color pays. But how much more effective color advertising is than black and white is wide open. A thorough and careful experiment on the value of color in advertising is reported by Warner and Franzen (*30*). Their study was based on slightly fewer than 1000 subjects representing a stratified sample of people in the United States. Ten pairs of advertisements appearing in a weekly magazine were used; each pair consisted of a full-page black-and-white and a full-page four-color advertisement promoting the same product under the same trade name. In addition, these authors used four-color and black-and-white advertisements for the same product but under different trade names. There was considerable uniformity among the advertisements used in this study because they were prepared by the same advertising agency. All were full page, all appeared within a four-month period in a magazine with a large circulation, and all the sponsors were under the same pressure to utilize space to advantage. The only factor deliberately contrasted was the four-color advertisement vs. the black and white.

Warner and Franzen tested one-half of their sample on black-and-white and four-color advertisements of each of the products and found that in interest value, color usually outweighed the black and white. They conclude, "Obviously the value of color in advertising depends upon a number of matters, such as the skill with which it is used, the adaptability of the product for black and white portrayal, and so on. These tests indicate a further consideration, the purpose of the advertiser. They suggest that in promoting a new brand or creating an association between product and trade name, color is not necessarily greatly superior. However, in protecting an investment in a familiar brand by maintaining and increasing its reputation for quality, color appears to have an advantage over black and white. It is possible that careful review of purpose in relation to the added cost of color may help to curb the trend toward uncritical selection of expensive presentation."

Another problem for the psychologist is the effect of advertising on children. Anyone with young children knows that a strong rival of nursery rhyme songs is the radio jingle in the guise of the singing commercial. In fact, the jingles about "Blue Ribbon Ice Cream" or "Pepsi-Cola" or many

other products cannot be dismissed without pondering the effects on our future consumers. It may be that the psychoanalysts of the future will uncover many early memories about the unconscious influence of advertising.

Guest (*11*) has attempted to determine the age at which brand awareness appears. Using a group of over 800 pupils in various grades of various schools, he administered an "awareness test." For example, the word "Texaco" appeared with the following five items after it:

Coffee
Automobile
Tire
Gasoline
Don't know

The subject was asked to respond with one of these five. Guest found that the number knowing the brand increased with age for all products except cereals. The reason for this difference in the case of cereals is that over 90 percent knew cereal brands even at seven and eight years of age. Apparently the box-top technique, in which the box top is sent away for a magic ring, airplane, or some such souvenir, appeals to the children very early. Whereas between zero and 25 percent of the subjects were familiar with brands of radios, watches, coffee, and typewriters at the ages

Table 19.3. The "Mental Age" of Advertising

| Age at Which 76% Knew Brands | Product |
|---|---|
| 7 and 8 | Cereal |
| | Automobile |
| 8½ | Gasoline |
| 9 | Soap |
| 11 | Magazine |
| 11½ | Store |
| | Toothpaste |
| | Bread |
| 14 | Coffee |
| 15 | Gum |
| 15½ | Tire |
| 16 | Watch |
| | Typewriter |
| 18 | Radio |
| Never | Razor |

of seven and eight, over 75 percent of the 18-year-olds knew these same items by brand name. Table 19.3 presents the various products according to the age at which 76 percent or more showed brand familiarity; this table might be referred to facetiously as the "mental age" of advertising.

Guest found that children in the lowest economic groups were not as familiar with brand names as other children. Children with higher IQ's were more familiar with brand names than others. Since, with one exception, brand awareness bore no relationship to the number of siblings in the family, brand awareness may be assumed to be the result of the advertising rather than of older children making the younger ones advertising-conscious. It may well be that advertising to children is effective in terms of their future acceptance of the product when they become adults. Any parent knows that it is also effective in the present, since only those cereals which have the magic something or other are "good," according to the child.

### Radio and Television

Whereas magazine and newspaper advertising appeals to the sense modality of seeing, radio appeals to the sense of hearing. Which will be more effective is often an important problem for the advertiser, who must decide whether to use one or both media. If he uses both he must also decide how best to allocate his funds. The problems of radio advertising as compared to magazine advertising are many. For example, an audit of circulation figures will tell the advertiser how many people regularly buy the magazine; a consumer survey will indicate how many people read each issue of it. But to determine how many people actually listen to a program on the air is quite a different problem and must be attacked in a different way.

The important question regarding the effectiveness of radio advertising is whether the radio program actually sells the product. In a detailed experiment, Stanton (*25*) shows conclusively that radio programs do sell products. He based his study on a radio program that was broadcast over a limited chain for a six-month period. The two markets he used were approximately alike with respect to population, size, retail sales, and retail outlets. They differed primarily with respect to radio advertising, since in one market the product was advertised by a radio program and in the other market there was no such program. The survey reveals that the sales were 88 percent greater in the radio market than in the non-radio market. Stanton obtained this figure by sampling 20 percent of the dealers

in each market; he secured exact sales figures from an actual count of the dealers' inventories and sales records. In the radio market, 2455 sales were made as compared with 1407 in the non-radio market. Analysis of sales in the radio market revealed that the brand had a sale 81 percent greater than the next most popular brand among the listeners; among the non-listeners, the sale was only 7 percent higher. This was determined by phoning the families while the program was on the air and interviewing them later. Stanton found that the sale of the brand to "day-to-day" listeners was 363 percent greater than that of the nearest competing brand; for non-listeners it was 59 percent higher. This study indicates that the more one listens to a program, the more he purchases the product advertised.

The question as to whether there is greater memory for material which is visually presented as compared with material presented orally has been studied in numerous experiments. Most of the studies agree that material presented orally has greater retention value than material presented visually.

Measuring the size of the radio audience is one means of ascertaining the popularity of a program and has been given considerable attention. It is assumed that a relationship exists between program popularity and advertising effectiveness. The most popular method of determining audience size is by telephone calls. One form of this is the telephone coincidental technique. Every $x$ name in the directory of a particular city is telephoned and asked about the radio program being listened to at the time of the call. In another somewhat similar method the telephone call is used as the source of data, but the respondents are asked about radio listening over a given period of time. Although the telephone technique is widely used, it is far from certain that it is the best method, because only a comparatively small number of families in the low-income groups have telephones and hence a sample of only telephone subscribers is a biased sample from the point of view of socioeconomic status. Furthermore, little if anything can be learned in this way about the status of the respondent and his family.

Another technique for measuring audience size involves the attachment of a mechanical device to the radio. One such device is the Neilson Audimeter, a recording apparatus that is wired into the radio and records both when the radio is on and the station to which it is tuned. The difficulty with such devices is that the fact that the radio is on does not guarantee that anyone in the household is actually listening to it.

Interviews are also used to measure the size of radio audiences, but in

addition to the cost there is the problem of errors in recall which lead to misinformation being given to the interviewer. Sydney Roslow has developed a technique using the personal interview which he calls the "roster method." The interviewer establishes the time that the respondent was listening to the radio and then presents him with a complete roster of programs for each fifteen-minute period mentioned. In many respects this method has advantages over the others as far as accuracy and meaning are concerned.

Just as there is no single outstanding and effective means of measuring the value of an advertisement, so there is no one method that accurately measures the size of radio audiences. Both these problems are awaiting solution, and the person who finds one will be handsomely rewarded. To date, the writer does not have even a "bright idea," but he hopes his readers will.

There are many other problems in radio research that cause the sponsor considerable concern. Both the need for better methods of pretesting a program and research conducted by radio stations to improve the kind of programs on the air have resulted in the invention of the program analyzer by Stanton and Lazarsfeld (*17*). This very simple and yet in some respects ingenious machine measures the reaction of a radio audience to programs. Essentially it is a simple modification of the polygraph. The subjects are seated and listen to a radio program; their hands are near two buttons, one green and the other red. The listeners are instructed to press the green button if they like what they hear and the red button if they dislike any part of the program; they are to keep the respective buttons pressed down as long as the part of the program they either like or dislike is on. When the subjects are neutral, they do not press either button. The button is attached to a needle that moves in one direction or another, and this movement is recorded on a revolving drum. Since the time is also recorded on this drum, the parts of the program which the audience likes and dislikes can be determined. Naturally, the program analyzer does not indicate why a particular part of any program is liked or disliked, but it furnishes leads which enable such facts to be established in interviews. It has been widely used in the pretesting of radio programs, especially by the Columbia Broadcasting System, and, more recently, in pretesting motion pictures as well as plays. The utter simplicity of this device, which is affectionately called "annie" in the industry, is very impressive and the technique has great value.

There are many stories about the value of the program analyzer. One

woman had been broadcasting on a recipe program over a certain station for a long time. During one of the tests in which the program analyzer was used, she happened to mention something about a visit, and the analyzer immediately registered a change in the receptiveness of the listeners. The interviews that followed the test revealed that the audience thought her voice more in character when she was talking about the trip than when she talked about recipes; she just did not sound like a housewife. Needless to say, her program was changed, with great success for all concerned. The result using the analyzer on one radio program is shown in Figure 19.3.

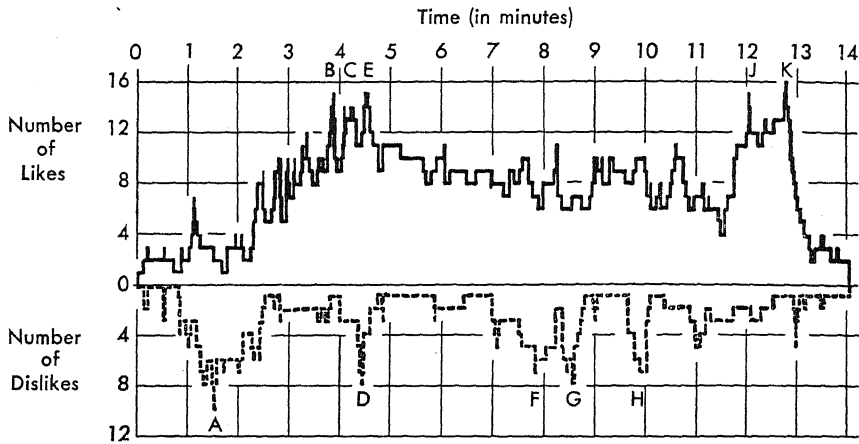



*Figure 19.3.* Program Analyzer Results. (From J. N. Peterman, The "program analyzer"; a new technique in studying liked and disliked items in radio programs, *J. Appl. Psychol.* [1940], *24*:728–741.)

The psychological role of the daytime serial, children's programs, and other types of programs is of vast interest to the radio executive as well as the educator, and is the subject of continuing research. Another field of research that concerns radio people is the relationship between the physical quality of the sound and its psychological qualities, that is, the tonal range preferred by an audience. Do listeners like a wide and complete tonal range, or do they prefer it to be held within limits?

Peatman and Hallonquist (*21*) using the program analyzer found that national network programs can be satisfactorily analyzed, at least for urban audiences, with samples of subjects drawn from different geographic areas. A sample from New York and one from Los Angeles showed rather strong similarities, as indicated in Figure 19.4.

Table 19.4. Extremes of "Likes" and "Dislikes" of 52 Subjects Judging the Public Affairs Weekly Program

| Part[a] | Program | | | Average Percentage[b] | | Typical Comments |
|---|---|---|---|---|---|---|
| | Time | Medium | Content | Likes | Dislikes | |
| A | 1′ 29″–1′ 31″ | Organ | Loud Chords | 5.8 | 19.2 | "It was too weird . . ." "I didn't think organ music was fitting there." |
| B | 3′ 33″–3′ 50″ | Narrator | "A man's home is his refuge . . . a secure nation is a strong nation." | 21.8 | 4.8 | "It's the principle that underlies that thought . . . I believe them very firmly." ". . . I know it's true . . ." "I liked the voice . . . It was very earnest." |
| C | 3′ 58″–4′ 20″ | Narrator | Elaboration on the right of trial by jury. | 24.9 | 5.8 | "The wording of it . . . We all feel we have a right to life, liberty and so forth." "I believe in it. It is the only fair way." |
| D | 4′ 20″–4′ 30″ | Chorus | ". . . America was built on man's promises to man . . ." | 22.9 | 13.5 | "I dislike the quality of the voices and the sensationalism . . ." ". . . it sounded awfully stilted." |
| E | 4′ 30″–4′ 40″ | Narrator | ". . . the American way of life . . ." "No tyrannies, no injustices, But—" | 27.1 | 6.9 | ". . . the American way of life. . . . My ancestors have lived here since 1678 . . ." ". . . the way he appealed to you personally: 'Listener—.' " |
| F | 7′ 48″–8′ 0″ | Dramatization | Cop breaking up open air meeting. | 12.9 | 11.9 | ". . . It's just loud nonsense . . ." "The presentation . . ." ". . . It was shouting to me . . ." |
| G | 8′ 16″–8′ 36″ | Chorus | "There was a time when men could gather . . ." | 12.3 | 13.3 | "It was going nicely and all of a sudden you get that rasping crowd." |
| H | 9′ 35″–10′ 5″ | Chorus | "This is a strong nation . . ." | 16.9 | 9.6 | "I dislike the presentation . . . the chorus of voices annoyed me . . ." |
| J | 12′ 0″–12′ 5″ | Narrator | War hysteria generates suspicion. | 27.0 | 4.6 | ". . . because it's true . . ." ". . . we *are* over suspicious . . ." ". . . the only voice in the broadcast that seemed . . . real." |
| K | 12′ 45″–12′ 50″ | Narrator | ". . . We are a strong nation . . ." | 30.0 | 1.9 | "I was feeling very patriotic . . ." "I like his voice. It wasn't so dramatized." ". . . sounded very rational and just." |

[a] The letters refer to those on the graph in Figure 19.3.
[b] These are averages of the percentage of the subjects who registered "likes" or "dislikes" in each second of a given part of the program.

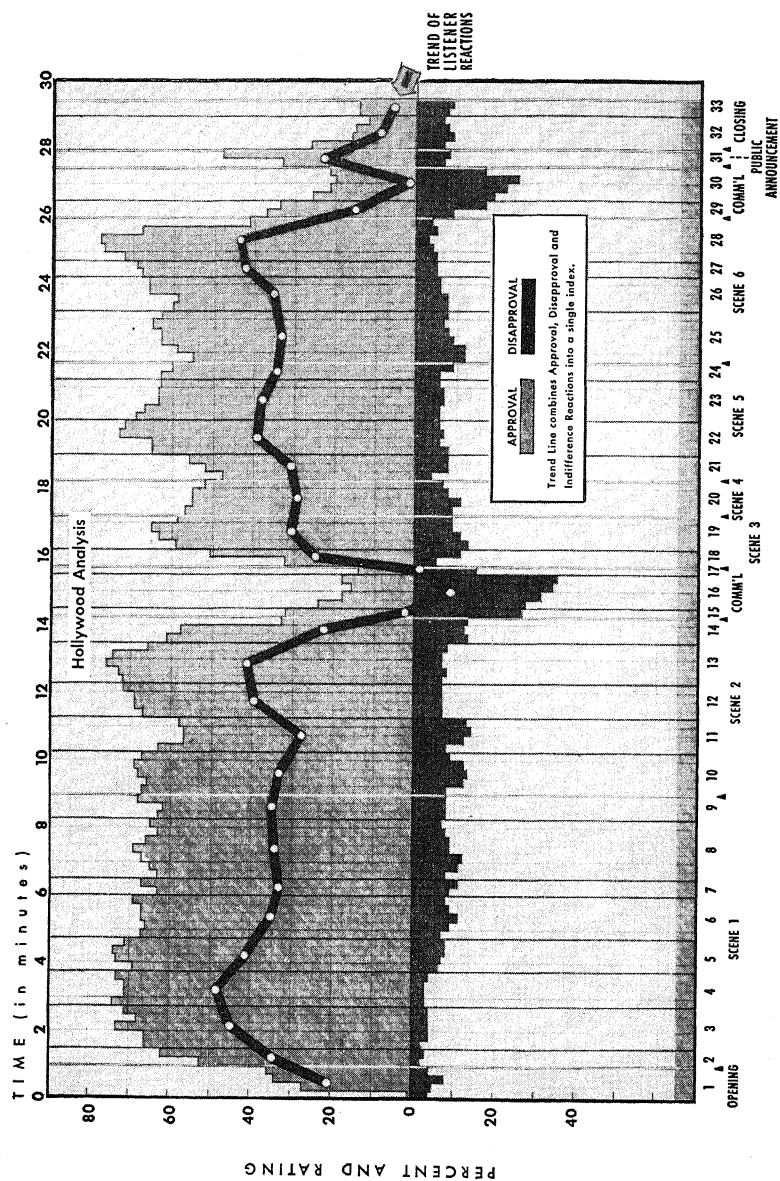
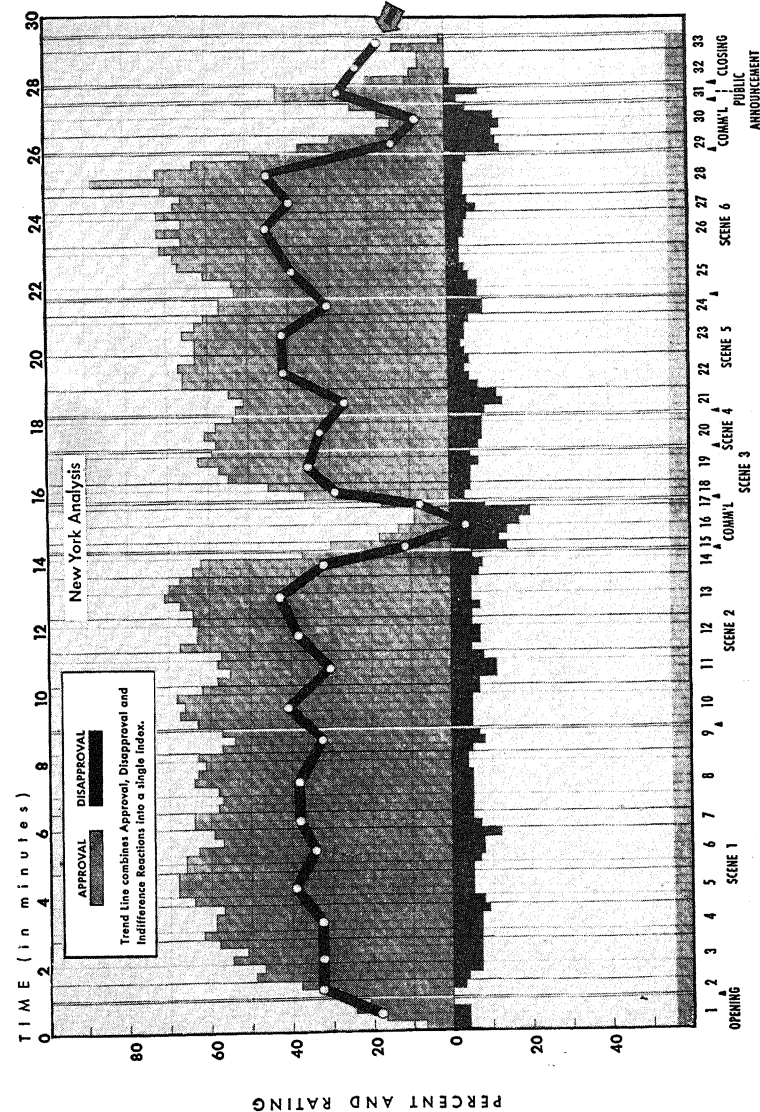



*Figure 19.4.* Comparison of Hollywood and New York Listeners: Hollywood Comedy Drama. Top, profile of listener reactions, Hollywood listeners. Bottom, profile of listener reactions, New York listeners. (From J. G. Peatman and T. Hallonquist, Geographical sampling in testing appeal of radio broadcasts, *J. Appl. Psychol.* [1950], *34*:270–279. By permission of Tore Hallonquist, Director of Program Analysis Research Department, CBS Television.)

One must be aware of the merchandising and product development phases of radio to know that it will continue to play an important role as a vehicle of communication and entertainment. Small sets, alarm-clock radios, portable sets, and auto radios have tended to personalize radio and make the traveler as well as the bedridden individual find personal meaning in his radio. Punishing a child by sending him to his room is not real punishment if the child has his radio and his imagination. It affords seclusion and contact with the world at one and the same time.

Television threatened to wipe radio out. Radio stations and chains were apprehensive about encouraging the infant that would eventually swallow rather than bite the hand that was feeding it. After all, television appealed to two modalities at the same time—visual and auditory. Similar research problems confront both radio and television, namely, audience characteristics and size, program effectiveness, and, last but not least, advertising effectiveness.

The National Broadcasting System conducted a study by interviewing the same population at two different points in time (*4*). The investigation centered on 42 TV advertised brands and 44 non-TV brands. It was found that the average brand in the three-month period tended to maintain its sales position but two out of three people in the total customer group either stopped or began buying in the period. This brand switching is the potent argument for not only advertising but continuing to advertise. The conclusion drawn in the study on television is that if people stop viewing,

Table 19.5. Characteristics and Habits of TV or Non-TV Population, 5067 Men and Women—January, 1951

| | TV Owners | Non-Owners |
|---|---|---|
| Percent of total sample | 51% | 49% |
| Mean family income | $44.90 | $38.64 |
| Mean family size | 3.68 persons | 3.06 persons |
| Age | 39 years | 40.6 years |
| Average grade completed | 11 years | 10.9 years |
| Automobile owner | 61% | 39.4% |
| Telephone | 74% | 56% |
| Favorable attitude toward television | 85.8% | 59.3% |
| Minutes spent yesterday—magazines | 10.8 | 15.1 |
| Minutes spent yesterday—newspapers | 46.8 | 50.4 |
| Minutes spent yesterday—radio | 60.8 | 119.4 |
| Minutes spent yesterday—television | 135.3 | 10.2 |

Table 19.5 is reprinted from *TV Today*, Report 2, an NBC Study.

they stop buying the product. If they begin viewing, they start buying, and if they continue viewing, they continue to buy.

Another study by NBC interviewed a precise probability sample of household heads in New York City (2). The findings indicate rather interesting characteristics of the TV owner versus non-TV owner. The data from the study are presented in Table 19.5.

The report found that comparing TV set owners had owned their sets less than six months or more than two years reveals that time spent with TV, radio, newspapers, and magazines remains rather constant. When attitude toward advertising was compared with recall it was found that 47 percent recalled "well-liked" advertisements, 30 percent recalled "neutral" advertisements, but 37 percent recalled "disliked" advertisements. These data confirm the psychological principle that emotionally invested experiences tend to be recalled more than neutral experiences.

### Media Research

The competition of different media for the advertising dollar is intense, and the television study referred to makes it mandatory to refer to the research of *Life* magazine. This magazine has clearly taken the lead in conducting research in this area. Such studies as "A Study of the Accumulative Audience," "A Study of Four Media," and "A Study of the Household Accumulative Audience" represent millions of dollars in investment. They have resulted in new and keen improvements in methodology and a display of an unparalleled awareness of ethics involved in advertising research.

All three studies were conducted independently by Alfred Politz, and A. Edward Miller of *Life* was responsible for the broad planning and programing of the research (*26, 27, 28*).

The first study had as its objective the determination of the number and kinds of people who read one or more issues of *Life* in a 13-week series. Respondents were interviewed three separate times about one month apart. The population interviewed comprised a probability sample in which neither the selection of places nor households in them were left to interviewers' judgment. The interviewers were intensively trained after considerable questionnaire revisions and controls in procedure had been effected.

The results can be considered accurate since some of the characteristics obtained in the sample could be checked against total census figures.

From the sample of approximately 5000 households the results were projected to the total population. Figure 19.5 shows the cumulative audience of *Life* in a 13-week series.

The study presents data on such characteristics of *Life* readers as age,

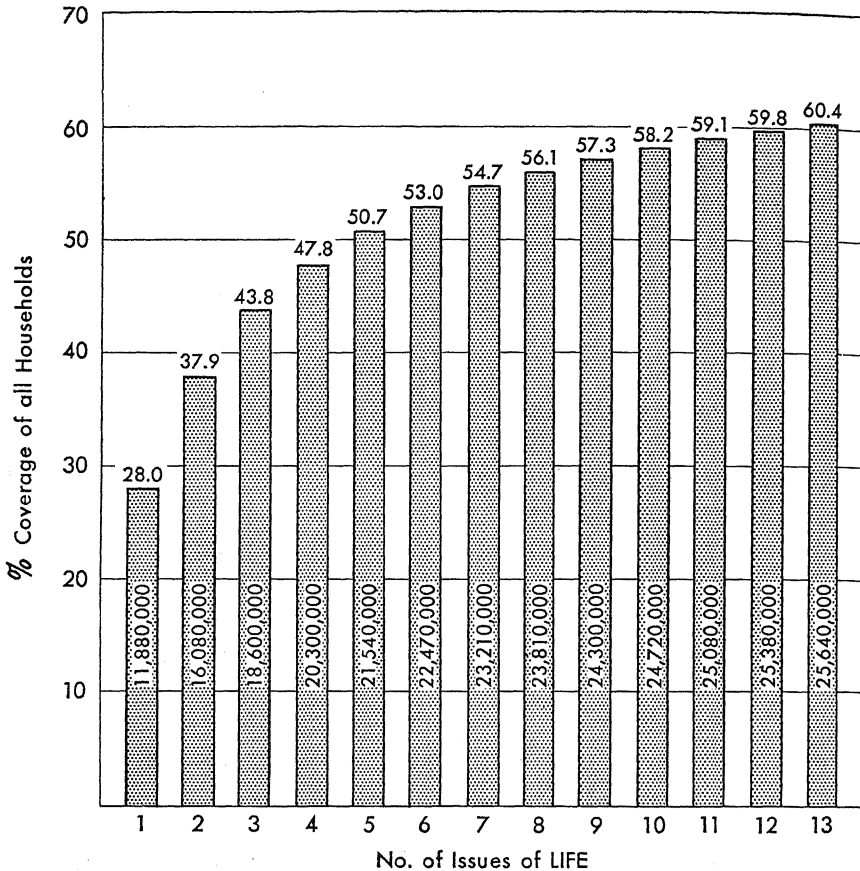



*Figure 19.5.* Cumulative Household Audiences of *Life* in Total. (From *A Study of the Household Accumulative Audience of* Life, published by *Life* magazine. Copyright, 1952, by Time, Inc.)

education, socioeconomic status, urban or rural residence, tenure of home, and family size. It also gets a measure of the repeat audience of *Life,* that is, the number who read more than one in 13 issues.

The household accumulative study shifted its emphasis from characteristics of individual readers to all household characteristics in which

*Life* is read. In many respects the procedural aspects were similar. To sustain the validity of the results, findings of size of household and categories of occupations on both studies are compared with census reports. Figure 19.6 presents these data.

*A Study of Four Media* represents an advancement in audience research studies. It reports findings not only in *Life* but also in *Saturday Evening Post, Look, Ladies' Home Journal, This Week,* leading radio programs, and leading television programs. According to the data acquired, the percent coverage for each of the items investigated is reported in Table 19.6.

Table 19.6. Percent Coverage of U.S. Population

| | Reading 1 or More of 6 Issues | 1 or More of 4 Issues or Programs |
|---|---|---|
| *Life* | 50.6% | 39.8% |
| *SEP* | 29.6 | 25.5 |
| *Look* | 41.8 | 37.9 |
| *Ladies' Home Journal* (female) | 35.1 | 28.9 |
| *This Week* | 35.3 | 24.5 |
| Jack Benny | — | 35.1 |
| Amos 'n' Andy | — | 32.1 |
| Charlie McCarthy | — | 25.0 |
| Lux Radio | — | 21.6 |
| Colgate Comedy Hour | — | 42.6 |
| Show of Shows | — | 42.3 |
| Red Skelton | — | 39.2 |
| Texas Star Theater | — | 38.0 |
| Fireside Theater | — | 29.0 |

Table 19.6 is reprinted from *A Study of Four Media*, a study made for *Life*. Copyright, 1953, Time Inc.

The attempt to compare such different media as magazines, radio, and television presents many problems, but this report wisely refrains from interpretation and is content to carefully describe procedure and controls and present the results. Establishing the percentage of a population having seen a magazine or a television program and further establishing that approximately equal numbers have been made susceptible to the advertisement does not establish the relative effectiveness of the advertiser. If one assumes that the more, the better, then a set of hypotheses can be created that will differ greatly from those based upon other criteria of effectiveness. Such measures as repetition, amount of time that is avail-

| | 6212 Households Used for the 1950 Study of Individual Audiences (Midpoint of Interviewing: September, 1949) | 1926 Households Used for the Present Study of Household Audiences (Midpoint of Interviewing: March, 1951) | All Households in the United States |
|---|---|---|---|
| | % | % | % |
| Number in household: One person | 6.9 | 6.3 | 9.0 (1) |
| Two | 26.6 | 26.8 | 28.6 |
| Three | 23.0 | 21.8 | 23.0 |
| Four | 18.8 | 19.1 | 18.1 |
| Five | 11.2 | 11.6 | 10.5 |
| Six or more | 13.5 | 14.4 | 10.8 |
| Total | 100.0 | 100.0 | 100.0 |
| Median | 3.2 | 3.3 | 3.0 |
| Employment and occupation of household head: | % | % | % |
| *Employed* | 80.4 | 81.4 | 79.7 (2) |
| Professional, semi-professional | 5.1 | 4.9 | 5.3 |
| Proprietor, manager, official | 10.9 | 10.2 | 10.3 |
| Clerical, sales | 10.0 | 9.6 | 9.4 |
| Craftsman, foreman | 14.4 | 18.6 | 15.3 |
| Operative | 13.1 | 12.2 | 16.0 |
| Laborer (non-farm) | 5.4 | 4.4 | 4.9 |
| Service worker | 5.6 | 5.1 | 5.9 |
| Farmer, farm laborer | 15.9 | 16.4 | 12.6 |
| *Not employed* | 19.6 | 18.6 | 20.3 |
| Total | 100.0 | 100.0 | 100.0 |

*Figure 19.6.* Cumulative Audience of *Life*: Size of Household and Categories of Occupations, Compared with Census Reports. (From A *Study of the Household Accumulative Audience* of Life, published by *Life* magazine. Copyright, 1952, by Time, Inc.)

able, duplication of audience, and, of course, attitude of audience may lead to different findings.

*Life* has attempted to study the problem of duplication in the magazine medium of advertising (29). Figure 19.7 presents the readers of *Life* who also see *Look* and the *Saturday Evening Post* in each of the possible combinations. The problem of additional or duplicating coverage is important to those who spend money on advertising.

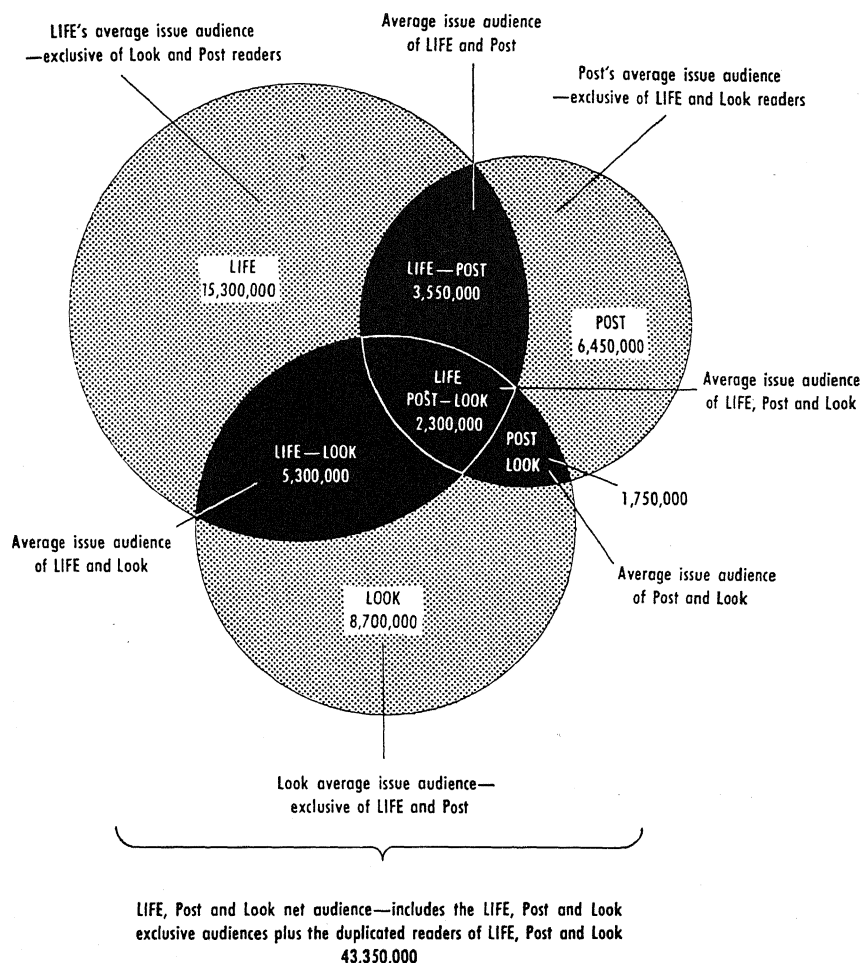



*Figure 19.7. Life, Post,* and *Look* Net Audience. (From *A Study of Duplication,* published by *Life* magazine. Copyright, 1954, by Time, Inc.)

## Summary

The main value of psychology in advertising is its scientific methodology. The psychologist in an advertising agency is called upon to conduct research on a wide assortment of problems.

Consulting a list of motives in an attempt to understand advertising appeals is generally fruitless because many drives operate within and on the individual at the same time. Furthermore, most lists are artificial. The newer fad in connection with advertising is motivation research. This concept is variously defined and not clearly understood.

Various methods are used to test advertising effectiveness; among them are the jury method, split-run technique, recognition test, brand preference, recall test, sales test, coupon return, and use of the psychologalvanometer. Brand preference, trademark identification, the use of color in advertising, the value of illustrations, and trade-name confusion are a few of the technical problems in advertising that psychologists have studied by means of research.

The effect of advertising on children is considerable. Many advertising campaigns are slanted toward them. They can influence their families to buy, and they may be conditioned in their own future buying habits.

The radio has resulted in research methods to measure size of audience, effectiveness of program, and other problems peculiar to the field. The program analyzer is valuable as a means of understanding the likes and dislikes of the radio audience.

Television presents research problems similar to those that exist in radio except that it is a visual as well as auditory modality.

Within the field of advertising media research reaches paramount importance. The series of studies for *Life* appear to have taken the lead as to methodology, controls, and validity of results.

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CHAPTER 20

# Selling

THE field of selling is rather closely related to consumer research and advertising. As we have seen, one of the objectives in consumer research is to determine the wants and needs of the potential buyer. The salesman who is fortified with this ammunition is aided in achieving his objective.

Sometimes it is exceedingly difficult to differentiate between advertising and selling. Most advertising is indirect selling, but some of it is rather direct. In any event, its main purpose is to sell the customer the product, service, or institution, or at least "soften him up" for the sale.

Experimental investigations in the sales field have lagged behind such work in the field of advertising. The methodology of selling has not been inspected as rigidly as has the procedural development in consumer research. Because of this, psychology has not up to the present particularly contributed to the subject of salesmanship, except in the selection of salesmen.

A restatement of the meaning of psychology is in order here, since the relation between psychology and salesmanship is often misunderstood. Psychology gathers facts about human behavior by using the experimental and other acceptable scientific methods. It is not synonymous with "common sense" nor does it explain behavior on the basis of the concept "human nature." Many who do not understand the substance of psychology confuse it with any analysis of human behavior along nonscientific lines. The field of selling offers a good illustration of the use of "psychology" to explain behavior when psychology is not involved. This does not mean that a valid psychology of selling will not be developed in the future. The work done by psychologists will surely have fruitful results, provided scientific methodology is introduced and generalizations are based on data rather than speculation.

The basis for a psychology of selling should be the dual character of

salesmanship. Salesmanship may perform a useful service in our society but it may also cause conflict. Thus it not only provides an income for some people but also enables the consumer to satisfy both his material and his psychological needs more readily. However, selling also introduces a clash between the salesman and the consumer. Whereas the consumer must decide on how best to apportion his income among his various needs, the salesman must sell the consumer *his* product to the possible exclusion of other products. The consumer may be unable to decide whether to buy a washing machine or a vacuum cleaner. Each of the competing salesmen will put pressure on him to buy *his* product, not the other salesman's. Men who sell competing brands of the same product try to exclude each other from getting any part of the consumer's business. As a result, the consumer often finds that the service factor in selling has become minimal because the salesman's behavior is patterned according to his own needs rather than the consumer's. This results in a conflict involving both individuals.

The psychologist should recognize this basis of conflict in selling and study the sale from the point of view of both the customer and the salesman. He can make a scientific contribution along either line provided he does not resort to idle speculation and "armchair reasoning."

### Sterility of Sales Formulas

Some psychologists and many sales managers have in the past proposed formulas for successful selling. The many intangibles connected with the selling process have led to the introduction of systems designed to make selling easier. Many of these systems use a sales formula based upon psychological concepts. The most widely known formula, and one which was in existence before the turn of the century, is known as "A-I-D-A." Although the explanations of this formula vary, the basic idea is that a buyer has a mental stream and that a sale meets with less resistance when the talk follows this mental stream. The letters A-I-D-A stand for attention, interest, desire, and action. Thus the salesman is supposed to begin by gaining the attention of the customer. Once he has done this, he is supposed to arouse in the customer a state of interest and to build it up so as to create desire. When the desire is sufficiently strong, action follows—the act of purchasing the product. Some people add an "S" to the formula to stand for "satisfaction," a frame of mind which is supposed to follow the act of purchasing and predispose the customer to begin the "A" again. To assume that such a mental stream exists in the mind of the potential purchaser is ridiculous. Furthermore, it is an oversimplification,

for the chances are that the mental processes of the successful salesman and the overwhelmed buyer are not so simple. A salesman who was really concerned about the extent of the interest which must be present before the desire appears would probably resort to so much introspection and speculation that he would lose the sale. Salesmanship is a practical matter and the successful salesman is the person who learns its techniques and is not too concerned with psychology.

Another selling formula that is equally sterile is: Want—Solution—Action—Satisfaction. According to this formula, the salesman is to determine the existence of or create a want in his potential customer. As soon as this unbalanced state has made the buyer miserable enough, the salesman suggests a solution which, oddly enough, happens to be just the product he has on hand. In order for the customer to regain his balance, he must take action, that is, buy the product. This "satisfies" him, but only until another want is created at another time.

This is not to say that people do not have wants of a psychological or material nature. Of course they do. A product is for sale and the consumer may buy it, whether he wants it or not. The point is that there is no need to introduce psychology in such a situation.

A good scientific principle is to explain behavior along the simplest lines. Applying this principle here shows that much of salesmanship is not psychology. A selling formula, on the other hand, is an oversimplification of behavior. Both the salesman and the customer are complex individuals. The wants, needs, desires, and motives of both are not really reducible to a single drive; and so sales formulas, in most instances, are artificial. A salesman will do well to disregard such formulations if he wants to succeed.

### Aids to Successful Selling

Selling is a diverse occupation. At one extreme is the girl who stands behind the counter of a five-and-ten, puts the item the customer wants in a bag, and collects his money, after checking the price of the article. This person is usually called a sales clerk. However, many selling jobs are much more complicated. The selling of an intangible, such as insurance, demands a great deal more salesmanship, as does the selling of the complex machines which form the backbone of our industry.

Even though there are variations in sales techniques, there is nevertheless a common core of activity that runs through most sales. This includes:

1. Starting a sale.
2. Sizing up the customer.

3. Presenting arguments.
4. Meeting objections.
5. Narrowing the field to one item.
6. Closing the sale.

Before discussing each of these steps, we should emphasize that they constitute a psychologist's view of selling. Basically they are related to

*Figure 20.1.* Completing a Sale Sometimes Requires Ingenuity. (From *Fortune*, July, 1952, p. 95.)

successful selling; only incidentally do they happen to have anything to do with psychology. They are primarily concerned with salesmanship; they can be considered psychological only when they are thought of as the interaction between two people. The mainstay of the psychologist is the factual data gathered as the result of experimentation. There has been practically no experimental work in the field of selling, but there has been much speculation. The writer takes the liberty of offering these six aids

to selling on the basis of his past experience as a salesman rather than as a psychologist.

It is up to the salesman to begin the sale. The general practice in some department stores of insisting that their salesmen use a hackneyed phrase, such as "Good morning, may I serve you?" bears out this point. A sale is consummated as a result of conversation, and it is best to have the salesman begin it. Possibly just "Hello" and then a brief sentence about the item that the customer is looking at would serve as well. In starting the sale, it is important for the salesman to put the discussion on as warm and friendly a basis as possible. He should study the customer's reactions and decide on whether he is verbal or not, modifying his sales talk accordingly. Some people will buy if the salesman does a lot of talking, and others will buy if he says very little beyond merely answering questions.

This leads to the salesman's "sizing up the customer." While it is not claimed that such an evaluation is infallible, the experiences of many salesmen indicate that it is both possible and valuable. Moreover, "sizing up the customer" is not based upon intuition or mystical forces; it is simply an attempt to judge by observable evidence. For example, the way a person dresses and talks often indicates the price line he is most likely to be interested in—a conservatively dressed customer usually prefers conservative merchandise.

This aid to successful selling can be used to advantage in determining how much the customer is ready to buy. It is also useful in building sales volume because the salesman can spend more time with people who are ready to buy and less time on the others. For example, most sales of expensive household items are made when the husband and wife are together. This is an important clue for the salesman. Similarly, few people are likely to buy expensive items without some previous information; and if the salesman can gauge the extent of the information the customer already has, he can gear his sales technique accordingly.

One of the most important parts of the sales process is the presentation of arguments in favor of the product. When the salesman has a knowledge of his merchandise as well as a technical background, he is in a position to present the most forceful arguments. A successful furniture salesman knows many things in addition to the fact that a particular chair or suite is "good-looking." He knows something about the different types of wood used for furniture and also something about the more technical aspects of furniture construction. He is able to discuss period furniture, and a knowledge of interior decorating is not harmful. The salesman who

can present his arguments in a highly informed and factual manner sounds impressive and does not give the customer the idea that he is arguing with him or begging him to buy because he has to make a sale. When salesmen do not know all there is to know about the product they are handling, or do not believe in its value, they may resort to high-pressure methods. This is unfortunate. Reputable companies do not encourage such an approach. Although high-pressure salesmanship may result in a sale, it also increases the number of exchanges and returns. Furthermore, it often creates an unpleasant impression in the mind of the customer and he may believe that the company has taken advantage of him.

The salesman must be ready to meet a customer's objections with factual information; he must not become emotional about them. It is during this part of the sale that competitors enter the discussion. Stressing the advantages of your product and attempting to eliminate a competitor from the discussion as much as possible is generally regarded as good sales technique. Knocking competitors often makes the customer want to hear what they have to say; and if they have been misrepresented, he is likely to assume that the entire sales presentation has involved gross misrepresentation.

If a sale is to be made, the customer must decide or be persuaded to purchase a specific item. The sale is made after the customer, with the aid of the salesman, has eliminated all but one of the possible selections. An outstanding illustration is the sale of ladies' hats. The typical millinery shop has mirrored tables and comfortable chairs, but no hats are to be seen. The customer is invited to sit down and the saleswoman brings her a hat, which she tries on. The salesgirl says "Fascinating," "Scintillating," "Utterly gorgeous," or some such nonsense, but the customer politely asks to "see another one." The salesgirl puts the first hat back in the stockroom and brings out another one. In other words, the emphasis is placed on one hat at a time. Since women's hats are what they are, and a woman can look so vastly different in each of them, concentrating on one item prevents confusion. Similarly, an automobile salesman finds out whether the customer wants a two-door or four-door car and then emphasizes the car most likely to be purchased.

The sixth aid to successful selling is "closing the sale." Some people believe that there is a "psychological moment" in a sale; this is defined as the point when the customer is most ready to buy. Presentation of additional sales arguments beyond this point often hinders the sale. Whether there is such a "psychological moment" is not too important. The fact is

that there are ways of closing a sale without using high pressure. Among these techniques are the test close, the order-blank strategy, and the delivery question. In each of these the salesman assumes that he is ready to close the sale and he uses a little push to do so. An automobile salesman who really has to sell a car often uses the test close by asking a question like "What make of radio do you want installed in your car?" If the discussion then centers around the radio, it is a cinch that the car itself has been sold. In the order-blank strategy the salesman starts to write the sale; this frequently works as a close unless the customer has enough nerve to say, "Not so fast!" With the third method, before the customer has come to a definite decision the salesman asks, "Where do you want this sent?" The customer's reply often consummates the sale.

## How Not to Buy

In education too much emphasis has been placed on how to sell, and too little, if any, on how *not* to buy. Since most of us are consumers rather than salesmen, there is some point in teaching people how to resist the advances and onslaughts of salesmen. It might well be that if this were done we would have a sounder economy. It is with such a plan in mind that the following suggestions are offered to the consumer, and to the salesman as well when he himself is a consumer.

The most important step for the consumer is to avoid embarrassment. The average individual allows himself to be put in the position of feeling obligated to the salesman. He believes that because he has taken up the man's time he must buy something. He is embarrassed at having to tell the salesman that he really does not want the product or that he cannot afford the amount of money involved. The consumer should keep in mind that the salesman is really not doing him a favor; it is a simple business transaction and should be treated as such. During the war years when there was a shortage of consumer goods, customers had ample opportunity to realize this. With the return of the buyers' market, it is well for the consumer to remember that, just as the salesman had no personal and compelling reasons to "sell as a favor" then, so he does not have them now.

Another aid to successful "not-buying" is not to allow the salesman to present his smooth flow of arguments uninterruptedly. At some time during the sales talk, the customer should disagree with one or more of his statements; this often puts the salesman at a disadvantage. Another means of gaining the advantage is for the consumer to indicate early in the sales

talk that he only wants information and does not intend to buy; in this way he avoids embarrassment. Just as it is important for the salesman to concentrate on one item, so it is important for the customer not to let him do so. The salesman often gives his customer the idea that unless the sale is closed immediately, someone else will snap up the bargain or the price will go back to its regular and higher level. Here the customer might do well to say something like "I'm a fatalist, anyway"; in other words, if he misses out on this particular bargain, there will be another which may be equally good or possibly better.

The consumer who has been educated in "how not to buy" will nevertheless purchase considerable quantities of "stuff" in his lifetime. However, he will probably buy more of the items he really wants and needs, and less of the marginal items he cannot afford but buys because of the salesman's tactics. This is not to suggest that there must be continuous war between consumers and salesmen, but if the salesman has special information on how to sell, the customer should at least be able to balance this with information on "how not to buy."

### Contributions of Psychologists to Selling

Psychologists are qualified to improve the techniques of hiring personnel; therefore their major contribution to the field of selling has been in the selection of salesmen. Their work has proceeded along three lines. The first is the construction of standard and weighted application blanks. An application blank can become a tool in refining selection procedures. Comparing the background items of good and poor salesmen has shown that the two groups differ in such factors as age, marital status, previous job experience, and membership in clubs. Numerous studies have indicated that such items on the application blank can be scored in plus or minus values on quantitative scales.

A planned interview which covers a number of specific points is the second line along which psychologists have been working in the field. Although such interviews are useful in hiring salesmen, too often the sales manager does not know how to conduct them properly. When a person is trained to ask relevant questions and allow the applicant to talk freely, the interview is useful in selection. The use of a rating scale during the interview is both convenient and valuable, for it encourages the interviewer to look for observable traits and rate them on an objective basis. For example, if one of the items to be judged is the applicant's sense of responsibility as shown by his previous experience in accepting assign-

ments and carrying them through, a series of questions could be asked which would attempt to measure this trait.

A five-point scale might be constructed. The item at one extreme might be "refuses or fails responsibility." The second item might be "requires pressure to carry out task." The third, "handles responsibility with average success." The fourth, "accepts jobs and does them well." The fifth and most favorable rating would be "thoroughly responsible." With such a scale the interviewer would be able to make a summary judgment about the applicant which he could compare with that of various other applicants. Depending upon the company's policy, other traits—manner of speech, physical appearance, friendliness, initiative—might also be rated by the interviewer.

The psychologists' third line of work in this field is psychological testing. Two earlier chapters have described psychological tests and their use in industry. Since all of that material applies to their use in improving the selection of salesmen, only a few brief references will be made to specific work on the test selection of salesmen.

Ohmann (*14*) analyzed 31 items on one company's application blank and found that 13 of them were related to the criteria of success. These items are age, height, marital status, number of dependents, amount of insurance carried, amount of indebtedness, education, number of clubs, years on last job, experience in maintenance, average numbers of years on all previous jobs, average monthly earnings on last job, and reasons for leaving last job. These items were given weights on the basis of a scale and a critical score was determined which was found to be effective in selection. In addition to the weighted application blank, this particular company conducts three planned interviews and uses a psychological test developed for it. The test consists of three parts pertaining to "difficult sales situations," "building maintenance problems," and "arithmetical computation."

Otis (*15*) has developed a chart on which the applicant can be rated on various traits as the result of an interview. He also gave applicants the Strong Interest Blank, the Bernreuter Personality Inventory, and an Intelligence test. Otis found that there was a relationship between the personal items and the criteria. The Strong Interest Blank, when scored for life insurance and real-estate selling, was also related to the criteria, but the Bernreuter showed no relationship.

Considerable research has been done in the selection of insurance salesmen, and the Life Insurance Sales Research Bureau has developed an

aptitude index which is used by many insurance companies. Kurtz (*11*) has devised a test, the first part of which covers personal history and the second part personality characteristics. This test has been used with some success in selecting life insurance salesmen.

The Klein Institute of New York City evaluates the qualifications of applicants for sales positions by means of a battery of standard tests (see Flemming, 9). The battery includes the Otis Self-Administering Higher Examination of Mental Ability, Canfield's Sales Knowledge Test, the Strong Interest Blank, the Bernreuter Personality Inventory, the Moss Social Intelligence Test, and the Washburne Social Adjustment Inventory. The personality traits measured are stability, self-sufficiency, extroversion, dominance, self-confidence, social mixing, tact and diplomacy, sympathy to people, happiness in personal and social life, etc.

The Klein Institute states: "Since the tests are self-administering, they can be filled out at the office, or at home, or anywhere else without supervision." The wisdom of allowing a time test of mental ability to be self-administered must really be questioned.

The completed tests are then mailed to New York. After they are scored, test profiles and reports are submitted to the client with the recommendation to hire or not hire. The point has been stated previously that it is management's role to decide on hiring; it is the psychologist's role merely to describe or predict characteristics and behavior. The scores on the test battery are analyzed by a person who has not seen the applicant. This organization has established a set of norms based upon a random selection of 893 salesmen in 96 different companies. It reports that patterns of test scores vary for different companies and for different selling operations, which indicates that there is no single pattern of sales success. As evidence of the value of its procedure, this organization reports that 80 percent of the salesmen judged satisfactory on the basis of the analysis of test scores were later rated satisfactory by company executives. This percentage is unusually high for this type of work.

Flemming (*9*) also reports a study in which 10 men from a group of 17 applicants were recommended for employment; all 17 were hired. Nine of these ten were still employed after one year and were considered successful; the tenth had left the company to return to his former job. Five of the seven men who were not recommended but were nevertheless employed had left the company within a few months.

Rock (*16*) proposed a test to measure judgment in sales situations. It

consists of 25 items of the multiple-choice variety but the respondent ranks the answers from 1 to 4. This test was then administered to 25 salesmen, 26 production supervisors, and 31 technical salesmen. The results differentiate between salesmen and non-salesmen and also between commercial and industrial salesmen. No mention of reliability of the test is made, and while the results indicate that the three group were differentiated there is no indication whether poorer salesmen do poorly on the test and whether the better salesmen do better. Especially in the area of salesmen selection, the original groups are differentiable, but upon cross validation everything folds. By cross validation is meant trying the results on a new group and not the one used for the original standardization.

Bernard offered a critique of this test (*1*) and it mainly states that 13 of the 25 items paraphrase items from Canfield's test mentioned in the Klein battery. Rock answers by indicating he had no knowledge that the Canfield test existed (*17*). Whatever the facts in the Bernard-Rock controversy are, no one has ever published any data on studies on the Canfield test and a search failed to uncover any reference to it in either the Third or Fourth Mental Measurement Yearbook of Buros (*3, 4*). The few sales tests reviewed are generally devalued with relative ease.

Cleveland (*5*) in a comprehensive review of sales personnel research concludes that no single technique has been established which is appreciably better than any other despite the claims. He raises the interesting point that the problem centers around the criterion, What or who is a salesmen? A possibility exists that sales ability as a unique human trait does not exist. If this is true then the search for it will be in vain.

It appears that psychologists can make their major contribution to selling by improving selection techniques along three lines: first, by determining the personal items that are related to job success in specific sales situations and devising a scoring system to increase the objective evaluation of these items; second, by improving the validity of the interview and introducing a rating scale to aid sales managers in judging applicants or otherwise improve criteria measures; third, by using psychological tests which are correlated with criteria of success.

Another area in which psychologists might be helpful is in making recommendations for effective sales presentation based upon experiments. Not much has been done along this line up to the present time, but some work by Mitchell and Burtt (*13*) indicates that this approach is not beyond the realm of possibility. In their experiment they had a salesman

use four contrasting methods on subjects in a simulated sales interview. The four methods were:

1. Demonstration vs. oral elaboration.
2. Presentation of facts vs. short-circuit appeals.
3. Breezy vs. dignified approach.
4. Domineering vs. friendly approach.

According to these subjects, the demonstration, factual, and friendly approaches were superior to their respective opposites, but there was no difference in the breezy and dignified approaches.

Another novel study made by Fay and Middleton (8) attempted to determine the relationship between sales ability and the rating of transcribed voices of salesmen. The sales group consisted of 14 men and 15 women employed in a large department store and included both superior and inferior salesmen. Each individual read a prepared sales talk into a microphone. College students rated the transcriptions for enthusiasm, convincingness, and sales ability. The results indicate that the inferior and superior salespeople could be distinguished on all three items.

## Summary

The psychologist's contributions to the field of selling lag behind those made in connection with consumer research and advertising.

Sales formulas framed on "psychological" concepts are sterile; they provide no useful or effective aids in sales success. The six steps in selling are: starting the sale; sizing up the customer; presenting arguments; meeting objections; narrowing the field to one item; and closing the sale.

Since there are more consumers than salesmen, people should be educated in "how *not* to buy." This does not mean a continuous war between salesmen and consumers. No consumer should be embarrassed because he does not buy; he should recognize the salesman's tactics and know how to counteract them.

The psychologist's major contribution to the selling field is the development of more refined techniques for hiring salesmen. The weighted application blank, the standard interview bolstered by rating scales, and psychological tests have proved useful in the hiring of more efficient sales personnel.

However, care and caution must be exercised in evaluating the claims of those using tests to hire salesmen. No technique has been found to be appreciably better than the others.

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# PART VI •

## • Summary and Integration

THE last section of this book is devoted to a summary and integration of the material presented. It also is intended to point to the major problem confronting industrial psychology, namely, the criterion dilemma.

The book was somewhat arbitrarily divided into six parts. Part I served as an introduction and set the stage. Part II attempted to reach an understanding of the employee and presented those topics primarily related to satisfaction. Part III was concerned with the employer by reviewing the material on leadership as well as the causes of industrial harmony and peace. Part IV considered the major topics leading to an increase in efficiency. The fifth part of the book concerned itself with the distribution process.

CHAPTER 21

# Overview

**INDUSTRIAL** psychology can be successfully applied to encourage and promote democracy in industry. Our political democracy can survive and thrive provided further steps are taken to demonstrate that business and industry operate most efficiently in such a society. It would be paradoxical to insist that a political democracy is best and not maintain that an industrial democracy is also best. In order to achieve this objective, the individual employee and his relations with his fellow employees and superiors have been considered of paramount importance in this book. The primary goal of industrial psychology was set as the maximum satisfaction of man in his work world rather than any incidental increase in "efficiency."

## OBJECTIVES OF INDUSTRIAL PSYCHOLOGY

The introductory chapter stated the objectives of industrial psychology as (1) the enhancement of the satisfactions of employees and employers, and (2) the promotion of efficiency. It described industrial psychology as dedicated to the application of scientific methodology as a means of solving the problems confronting man in his work situation. It described the industrial psychologist and the different types of organizations in which he is employed as well as the types of work he does.

Reference was made to the fact that research often results in change and that it is resisted. It is necessary to recognize this in order to overcome the resistance. Otherwise, the best intentioned research and its results can be fruitless.

## THE HAWTHORNE STUDIES

The Hawthorne Studies were reviewed as a means of best understanding the interrelatedness of the various topics in industrial psychology and

demonstrating that conclusions must be based upon experimentation rather than on exhortations and claims. These studies are of tremendous significance because they show the role of the worker as a social being in a social setting. They emphasize that industrial experimentation which omits consideration of the workers' attitudes is likely to lead to false claims and erroneous conclusions.

Motives, attitudes, satisfaction, and morale comprise a unit and are of primary concern to the industrial psychologist. Knowledge of people's attitudes in relation to work and life makes possible an understanding of the complex phenomena known as job satisfaction and industrial morale. Depending upon these concepts, an incentive system may or may not work. It is important that adequate measuring instruments be introduced before prediction of these aspects of the human factor is made. Because of his training and background, the industrial psychologist can operate most successfully in this area.

### MOTIVATION AND WORK

Industry has oversimplified the complexity of motivation and has overemphasized the importance of the financial incentive. All the numerous wage-incentive systems are based upon the erroneous assumption that a financial incentive always increases production. The Bank-Wiring employees in the Hawthorne Studies did not respond in the predicted manner to a financial incentive, and they cannot be considered exceptions to the rule. The value of wages is relative and not absolute.

There are many reasons why people work. A fruitful lead in understanding the complex web of these motives is to obtain data from typical workers using the case history method. The most effective incentive is the one that enables the goal of both employer and employee to be achieved. An incentive aimed at reaching an employer's goal is not as strong as one which will achieve not only his goal but also that of the employees.

Since a specific incentive may be perceived differently by employers and employees, it may operate successfully toward one goal and not the other. Goals must also be perceived as short and long term and the view that a short-term goal will lead to a long-term goal must be examined carefully. It depends upon the relation between these two types of goals and the conflict existing between the employee's and the employer's goals. Attention must be given to the manner in which an incentive is perceived rather than assume that an identical incentive means the same thing to all.

### MEASURING ATTITUDES

In the chapter on measuring attitudes, the primary concern was methodology. Six methods were suggested: impressionistic, guided interview, unguided interview, questionnaire, scale, and indirect method. Discussion of the advantages and disadvantages of each method led to the conclusion that no single method could be considered uniquely superior. The method to be used depends upon the problem; and it is likely that a combination, rather than one method alone, will produce the most fruitful results in measuring attitudes and solving the related problems.

The evidence available makes clear not only that employers and employees have attitudes, but that their attitudes toward each other differ from their attitudes toward themselves. A clearer understanding of the differences in the attitudes of these two groups will lead to greater mutual sympathy. Lack of knowledge or an insistence that the two groups have similar attitudes will lead only to lack of sympathy and understanding.

Job satisfaction was defined as the result of an individual's attitudes toward his job, related factors, and life in general. Of the two views of job satisfaction, the first considers only specific factors on the job or factors related to it. The second is more comprehensive, for it recognizes that in addition to these specific factors there are factors basic to the individual's abilities, interests, and personality. Acceptance of the latter view requires that personnel departments which use scientific selection procedures attempt to relate people and jobs so that job factors will not frustrate the individual and create dissatisfaction. In order to gather uniform data, it was suggested that a modification of Woods' scale be used more widely and the results reported more freely. The 17 areas covered by this scale enable comprehensive consideration of specific job factors.

### JOB SATISFACTION

It was pointed out that the expectation of a positive correlation between job satisfaction and production may be unwarranted. The term "unseasonable sweetness" or the expectation that "good things go together" was regarded as naïve. The view that increasing job satisfaction will always increase production has its hazards. Since criteria available are often arbitrary and not perfectly correlated with each other, it follows that job satisfaction measures may be related variously to criteria and dependent upon such things as time measures and labor market conditions.

### INDUSTRIAL MORALE

Industrial morale was defined as an individual's feeling of being accepted by and belonging to a group of employees because of his adherence to the common goals and his confidence in their desirability. The four determiners of morale are (1) a feeling of togetherness, (2) need for a goal, (3) observable progress toward a goal, and (4) individual participation in meaningful tasks necessary to achieving the goal.

Morale can best be appraised by studying group and subgroup formations. The principles of sociometry as developed by Moreno and the modifications made by Jenkins in his nominating technique are useful in understanding group structures. Among the methods used to increase industrial morale are the expert approach, the industrial "spy," the industrial counselor, and the employee problem approach. For problems of an intimate personal nature the industrial counselor method holds the greatest promise, but for group problems the employee problem approach is recommended. This method encourages the use of democratic processes in arriving at the solution of the problem. Such specific items as posters, slogans, and speeches, which are ordinarily considered to be "morale boosters" in and of themselves, apparently are of little value unless the group decides to adopt it and it meets the requirements of the four determiners of morale.

Recent research indicates that sociometrically selected teams do increase production. Objective indicators when combined seem to predict effectively department or group differences in morale. Such objective indicators as turnover, absenteeism, and lateness may well be indices of group performance as reflectors of morale.

### UNEMPLOYMENT

A brief review of the effects of unemployment reveals a behavior pattern in which serious deterioration of the individual takes place. The unemployed tend to have two behavior manifestations that are normally not characteristic of the employed—irrational spending and loss of the sense of the passage of time. Although most authorities agree that unemployment should be fought, there is disagreement as to whether the local community or the federal government should carry on the battle. Both have their advantages and disadvantages, but there is nothing to date to indicate that one approach is so much better as to preclude the other.

Although unemployment has not been a national problem since the de-

pression days, its existence is always present to some degree. Younger people having no memories of the effects of unemployment may have a difficult time understanding their elders who still reveal certain psychological scars. Chapter 7 is intended to give insight. It is hoped that unemployment problems will generally be of historical or literary significance rather than practical problems.

### LEADERSHIP

Leadership and industrial warfare (Part III) are deserving of more serious study not only by psychologists but by all who are concerned with promoting democracy as a way of life. Regardless of the level of leadership, the problem confronting a leader is basically the same—the maintenance of a successful superior-subordinate relationship, for only then can leadership be considered effective. Democratic leaders encourage independence of their subordinates. Memorizing rules of behavior is no guarantee of effective leadership. Leaders should delegate authority, be available to employees, etc.; they should not simulate knowledge, interfere with work, or give too many or conflicting orders.

Role practice is a very promising technique for the training of leaders. The nominating technique apparently can select potential leaders early in their career.

While democratic leadership encourages independence in the subordinate, some subordinates respond only to a more forceful type of leadership. This would mean either training the subordinates or recognizing that democratic leadership may not always produce the most in the fastest time.

Recent research on leadership characteristics indicates that it is behavioral, situational, or related to the interaction of the leader and the group. The trend has been away from searching for traits that are "inherent" in the individual. Terms such as "consideration," "initiating structure," and "sensitivity" are replacing personality traits *per se* in an attempt to understand leadership characteristics. The outstanding feature of leadership training programs is its diversity and inclusion of many different approaches.

Mention was made that training, unless it results in an opportunity for environmental change and practice, may be frustrating. The point was also made that leadership often overlooked in the smaller companies may be more critical a problem than it is in larger companies.

## INDUSTRIAL WARFARE

Industrial warfare, a breaking-down of our industrial society, is promoted by either management or labor in its quest for power and its determination to gain prestige in the eyes of the worker. Groups of all kinds are formed in our society for many compelling psychological, social, and economic reasons. For one group to fight another or to charge that the other is un-American is often merely an evasion of the basic issues. As a sounder and more democratic pattern of leadership emerges and as the groups involved in industrial conflict assume more democratic characteristics a more mature solution of the problems can be anticipated. Honest and sincere collective bargaining on matters of joint control appears to offer the solution.

Little research has been done in this field. Content analysis of grievance procedures as well as case studies of industrial peace may well lead to valuable hypotheses. Much research is needed to establish that in this field, as in many others, conclusions based upon data are better than biased hypotheses acted upon as if they were conclusions.

## PSYCHOLOGICAL TESTING IN INDUSTRY

Chapters 10 through 17 comprise Part IV of this book. They deal with subject matter concerned with improvement of efficiency, primarily, and satisfaction, secondarily. This does not mean that the author has reversed the order of his objectives or has become confused. This means merely that psychological tests, job analysis and evaluation, work environment, fatigue and other phenomena, time and motion study and human engineering, training and learning and accidents all fall within the province of an industrial psychologist as he works from day to day. The industrial psychologist tends to be practical and scientific. He applies his knowledge and recognizes that business is concerned with efficiency leading to profits. However, he is not likely to conduct time studies, introduce colored walls, or train employees without considering that the worker must be viewed in his work setting as a human being. The industrial psychologist continually searches to improve his methods and evaluate his results.

The accepted role of the psychologist in industry is testing applicants for employment. Within limits, tests can be useful in improving the selection process. However, the greatest danger in their use in industry is their being oversold. Their indiscriminate use will result only in dissatisfaction

on the part of those paying the bill. Tests can be successful only when a correlation between job success and test results has been established. A psychologist with experience in this field should be called in when a firm contemplates the introduction of a test battery. He will be careful to determine that the employer's problem can be solved by means of testing. He will conduct the necessary research, but he cannot be expected always to make a positive recommendation on the use of tests, even after he has made a thorough study. Some experiments on testing in industry were reviewed to emphasize the care and caution necessary in this field, and the problem faced by the applied psychologist was brought into clear focus. Research must be conducted on the industrial scene, but it often requires modified and somewhat unorthodox procedures. His choice is either to adopt these procedures or to retire to the security of a laboratory which is frequently too far removed in meaning from the real problem.

Psychologists as a professional group are most concerned that their tests be properly used. A set of standards has been recommended which is calculated to make test development and usage reach a high professional level. This set of standards should become a code of practice and be adhered to most rigidly. If all in the profession follow this code and outsiders were prevented from misusing tests then psychologists would be subjected to less criticism on this score.

Most psychologists interested in the advancement of their profession as a long-term goal, rather than the making of a few dollars as a short-term goal, insist on caution in the use and application of tests for selection. They recognize that sometimes tests may work to predict trainability but not ultimate performance. They recognize that a difference exists in the use of tests as describers or as predictors. They also have learned that the degree of possession of a characteristic does not necessarily mean more success. They regard tests as useful tools but insist that research and caution rather than glib talk must accompany the use of tests.

### JOB ANALYSIS AND EVALUATION

A job analysis is an accurate study of the various components of a job from the point of view of both job and man. It has many uses and is equally important in small and large organizations. The job psychograph and the occupational ability pattern are two illustrations of psychological contributions in this field; both attempt to match the employee's ability to

the job. The occupational information that results from the integration of various efforts to make job analyses is useful in vocational guidance and selection as well as in industrial psychology.

Job evaluation, like any other area in the field, needs evaluation—and considerable work has been done. Critical incidents and forced choice are two of the more recent concepts attempting to identify factors related to successful performance. The use of rating systems has been mentioned, but the key seems to be not the system so much as the importance of training raters not only for rating but for reporting back the results.

### WORK ENVIRONMENT

The introduction of changes in the work environment has often resulted in unwarranted claims primarily because of the lack of sound experimentation. This area needs more careful experimental work before such claims can be considered as substantiated. An increase in production that follows the introduction of music, color schemes, or better lighting may be due only partially to the changed factor; some of it may be due to the fact that a change has been made. Employee attitudes and relations between employees and employer may also contribute to the increased production. Music in industry is the newest of a series of environmental changes. More careful experimental work has been done on it than on many of its predecessors and it is possibly because of this that the claims advanced for it have not been as weird. Production changes are usually positive but slight.

Measures of increased production are sometimes the attitudes and beliefs of those enthusiastically responsible for the installation, rather than more accurate behavioral measures. Attitude measures and behavior measures are appropriate, provided one is not accepted as a measure of the other and provided one does not assume their equivalence unless evidence is available.

### FATIGUE AND OTHER PHENOMENA

A major problem in industry is not the study of fatigue but rather the relationship between hours of work and production. The preponderance of evidence permits the generalization that a shorter work week is accompanied by a rise, rather than a decrease, in production. Not the nominal work week but the actual work week must be considered in computing production costs. Lateness, absenteeism, and other factors make

inroads on the nominal work week. Reducing the nominal work week not necessarily reduce the actual work week. Overtime adds to the n nal work week but may not add nearly as much to the total numb actual hours worked. For this reason overtime is often costly and inefficient.

Physiological changes and work decrements are reported to accompany mental work by some experimenters and not by others. The ultimate conclusion cannot depend upon the experimenter and the nature of his experiment. Possibly, the variable of motivation has been overlooked.

Confusion still prevails concerning the generalization that a shorter work week will not curtail production. The length of the work week should be less a "political football" and more the subject of experimentation.

Absenteeism may well be a function of poor management and not solely a reflection of the individual employee. The view that absenteeism is both employer-centered and employee-centered can lead to progress in understanding its occurrence.

#### TIME AND MOTION STUDIES

Time and motion studies when used correctly can result in greater efficiency. The greatest difficulty has been in their misapplication and in failure to acknowledge the psychological resistance to change. Another difficulty in studies made for the setting of wage or production standards has been the inadequate scientific treatment of allowances and the use of norms based upon too limited a sample. Time study can be a tool for both management and labor. The International Ladies Garment Workers Union has conducted such studies as an aid in collective bargaining. The average employee is capable of considerable improvement in his work methods if he is encouraged to follow the simple principles of time and motion studies.

In the final analysis, time and motion studies should be regarded merely as a technique that is subject to human errors of judgment and not as a thing of engineering precision.

Human engineering, the psychologists' extension of time and motion studies, is concerned with the design of machines according to man's abilities and limitations. It is concerned with designs, displays, controls, signals, levers, knobs, and, for that matter, any aspect of the man-machine relationship leading to making man's responses to the machine more accurate, speedy, efficient, and safe.

### TRAINING AND LEARNING

The correct application of principals of learning results in economy of training. Learning rarely ever takes place without motivation; a good teacher, whether in school or in industry, recognizes this fact, as well as the various stages of the learning process. Schools and colleges have much to contribute to industry in training new employees and retraining older ones. Closer coöperation between the two, in the form of "coöperative education," is one of the best methods of providing industry with qualified applicants for jobs.

The teacher in industry needs training in how to teach. An experienced worker is not necessarily a good teacher, nor can a person teach unless he knows his subject or the job the employee must learn. Too few companies have recognized the great importance of training. The newer methods of education which embody discussion, demonstration, and actual performance are better than the more formal type of drill and lecture; hence companies contemplating training programs will benefit materially by applying the "newer" methods.

Training just does not come naturally. It requires planning and attention to principles of learning. Industrial establishments would do well to keep both of these facts in mind.

Training programs, like any other part of industrial psychology, must be evaluated against criteria. Self backslapping may lead to being round shouldered but will not lead to proof that the training program has been effective.

### ACCIDENTS

In the chapter on accidents the need for caution in interpreting the principle of accident proneness was advised. A report that a small percentage of a population has a large percentage of the accidents does not establish support for the concept of accident proneness, for such figures are likely to result merely from chance expectancy. By recognizing that many factors contribute to accidents and by considering differences in the degree of an individual's accident proneness as a minor rather than a major factor, more can be accomplished in reducing accidents. Two approaches to the reduction of accidents related to the human factor are the clinical method and the educational campaign. The former tests, analyzes, and reëducates the individual, whereas the latter makes for group appeal. Accident reduction can be brought about by employer and employee working together for their mutual advantage. It can become one of the effective means of introducing and encouraging democracy in industry.

## Overview

A limitation in studying accidents is the variability in value of records. Greater attention should be paid to this matter.

The carnage created by the combination of automobiles, drivers, and highways demands consideration and an effective program to reduce the tragic effects that occur in all neighborhoods almost every day. Driving skill may or may not be related to safe driving. The theme might well be safer drivers rather than more skillful ones. The study of "near accidents" may hold many answers to the reduction of accidents.

### CONSUMER RESEARCH, ADVERTISING, SELLING

The last unit of this book includes the three chapters on consumer research, advertising, and selling. Consumer research is designed to determine the attitudes, needs, and wants of those who use the particular product or service. It illustrates the value of research in making business more efficient. In certain respects, business rather than scientific tendencies have prevailed in this field, and there have been hints of secret methods and results. Market research cannot justifiably claim secrets. Even those who know the secrets of the atom bomb admit that the secrets concern the time and money required to produce the bomb, rather than the method. Too much emphasis has been placed upon report presentation and not enough on the basic procedures of gathering the data. More care should be exercised in training and supervising those who collect the data upon which the reports are based.

In the related fields of advertising and selling there has been a tendency to misuse and misunderstand psychology. The "Psychology of selling" is mainly the sales manager's idea rather than the psychologist's. The psychologist's major contribution in advertising is the introduction of research methods and of restraint in interpreting results which might be claims not necessarily based on fact. Psychologists have also been helpful in devising more refined procedures for the selection of salesmen.

Behavioral studies related to consumer preferences offer considerable promise and should take their place alongside the attitudinal studies. Economic psychology is a subject likely to expand in importance and contribute to a better understanding of the consumer.

Caution is needed in applying motivation research unless it boomerangs. Within prescribed limits its findings can be useful. Media research tends to integrate the findings of consumer research as a means of selling advertising. It illustrates the closeness of these two fields.

Psychologists have contributed very little in the field of selling. Even the work done in selecting salesmen seems to be rather weak and limited.

This field can stand the care and caution of the psychologist and his methods. At present it appears as if sales ability is not a unique trait that is possessed by salesmen. It is entirely possible that the characteristics for success vary with the product sold, the company worked for, and the preconceived notions of the "gold-brick" salesmen who sometimes train the salesmen.

### The Criterion Dilemma

The content of industrial psychology is related to measuring, and improving when possible, a variety of situations effecting better employee-employer relations. These matters might arbitrarily be placed into two categories. The first are concerned with such concepts as motives, attitudes, satisfactions, and morale, as related to the job. Leadership and union-management relations provide a link between the aforementioned and the second category. The second are concerned with techniques to have employees become more efficient, i.e., "produce more." Testing, job evaluation, work environment, fatigue, time and motion study, human engineering, training, accident reduction are such techniques.

The role of industrial psychology also infringes on the relation between the consumer and the product or service offered by the business organization, and this results in attempts to make the distribution process more effective.

It is clear that in a perfect system these three broad classifications are interrelated. However, it is also clear that more satisfaction does not always go hand in hand with more production.

The industrial psychologist is concerned with two characteristics whenever he measures. One is reliability, that is, the stability of his measure. The other is validity or the degree to which the measure is effectively measuring what it is intended to measure. This means he is always searching for criteria against which to check his measures.

A review of the work presented allows the view that criteria tend generally to fall into one of three categories; namely, ratings, production figures, or employee behavioral manifestations. The primary difficulty is related to the degree to which these criteria represent the objectives of management. For example, shall the objective be solely to increase production regardless of its consequences? In other words, one might view these three types of criteria as related, but never perfectly. All three may go together in the same direction, but only up to a certain point. Beyond this point it is entirely possible that they do not pull together but rather

pull in diverse directions and create stress. All of this indicates that the quest for criteria is a real problem and deserves careful and scientific consideration. The problem is not solved or waved away, as if by magic, by merely designating something as a "criterion."

Now that the subject matter of industrial psychology has been presented and summarized it is, or should be, obvious to the reader that all problems have not been answered. This is as it should be. After all, the body of knowledge is rather young, and it remains for those who will enter the field to come to grips with the issues confronting us.

Possibly the greatest need before the systematization of the subject becomes complete is to become aware of the problems centering around the elusiveness and evasiveness of the criteria against which we must prove our worth. Most psychologists working in the field have been too preoccupied with developing reliable and valid instruments to be concerned with searching for reliable and valid criteria.

#### CRITERION DEFINED OR UNDEFINED

Fiske (*4*) has made an important point when he states, "a criterion is simply a label which we attach to something, such as the amount of work done or the ratings of a supervisor. Once a label is fastened on, we overlook the more or less subjective or arbitrary basis for its choice; we ignore the value judgment required in selecting the criterion. We begin to treat the criterion behavior as the ultimate goal and we do not look to see whether the criterion behavior serves any purpose."

Daniels and Edgerton (*2*) make the point that "a criterion derived from ratings or rankings should not be accepted as valid until it is shown to be related to some critical behavioral aspect of effectiveness." Severin (*9*) advises that care should be exercised in substituting one criterion for another since they very often are not equivalent; i.e., they do not correlate highly with each other. Brogden and Taylor (*1*) indicate that "criteria used are too frequently those most immediately available rather than those which would be most desirable."

### The Quest for Criteria

It is obvious that industrial psychology is confronted with a criterion problem. Very often overall effectiveness is determined by asking supervisors to rate employees. Considerable effort has been exerted to improve the effectiveness of the ratings themselves. Forced choice probably represents the most advanced and improved rating technique to establish the

criterion of employee effectiveness. However, it must nevertheless be remembered that answering items of this sort are still ratings or judgments. This applies whether they be self-ratings or estimates of the performance of others.

Certain researchers have tried the oversimplification technique by assuming all is reducible to production. In the first place, many jobs are not measured in terms of production, and "perceived production" may have little to do with actual production. In the second place, studies in production indicate variability, restrictions in volume, as well as many other complications that may very well mitigate it as an effective measure of performance.

Other workers in the field have naïvely believed that job satisfaction or employee morale when high will boost production, but it is hoped that the readers of this book have the information to question this too simple "gimmick." And so, we can go on to consider turnover, absenteeism, as well as other behavioral criteria.

What is most needed in industrial psychology is the courage of its conviction. For example, we have the right to ask the employer to state his objectives and then we must attempt to predict the wisdom of these objectives. First, the employer must be advised whether these objectives can be achieved and the answer may be predictable if previous research has been done. Otherwise the employer's objectives must be treated as hypotheses, and a form of an experiment must be contrived to obtain data that will lead to conclusions.

It does appear as if the tools, instruments, and methods of industrial psychology are worthy of confidence. The same high standards must be applied to criteria and objectives furnished by employers.

### PRODUCTION AS A CRITERION

Production is one of the most widely used criteria to determine industrial efficiency. Total production is used as a basis for wage rates. Many gadgets, gimmicks, and environmental changes are considered effective in proportion to their ability to increase production. Further, the entire system of time and motion studies has for its primary objective the increase of production. Fatigue and monotony are also considered as important because of their adverse effect on production. It is obvious that production is regarded by many as the all important key.

Actually much more research is needed before production figures and work curves are taken out of the theoretical realm. It is unfortunate that

more attention has not been paid to this basic problem. For example, restricted production is widespread, and yet incentive systems assume that their introduction results in the evaporation of restricted production. This is not true.

Years ago, a daily work curve was conceived as having a warm-up, reaching the peak at midmorning, and then a drop until lunch. The afternoon was supposed to resemble the morning period, except that it did not reach the morning peak and dropped much lower at the end. Such a curve, it was assumed, indicated the presence of fatigue. If the curve varied greatly and ended with a spurt, then monotony was supposed to be present. At least one large firm, a vendor of industrial music, bases a large portion of its research upon such assumptions. These curves have not generally been found to exist. The Hawthorne studies found, rather, that a flat constant work period was characteristic of the daily work process.

There is a need for basic research in the characteristics of the worker and his rate of production. Rothe (6, 7, 8), in certain respects, has been doing some of this work. He finds that work curves take on many different forms and do not assume any characteristic predictable patterns.

The value of Rothe's work lies primarily in measuring production of workers on similar jobs. His study of the output rate of butter wrappers is a good illustration of light manual repetitive work so common in industry. It goes a long way toward exploding the "myth" of the daily work curve with fatigue being present. In Rothe's study of machine operators, the major points to consider are the extent of individual differences of workers in similar jobs and the variability in production from worker to worker in different periods.

The United States Public Health Service study on Fatigue and Hours of Service of Interstate Truck Drivers (3) combines the laboratory measures and actual work conditions with realistic balance. The fact that its conclusions are not as positive and clear cut as one might wish is a tribute to the scientific demands that conclusions be based upon results obtained from the data.

The industrial psychologist should concern himself more with work curves. It may well be that both fatigue and monotony are concepts that are not too important in industry, simply because they do not ordinarily exist on most jobs for most workers. It may be that the worker paces himself so as to avoid the onset of fatigue and monotony. If this is true, then other factors such as attitude, motives, selection, and training are

more important in determining total production. It may be true that production as a criterion needs the same kind of rigid reëxamination that the concept of accident proneness received.

In other words, production may have too readily been assumed to possess more objectivity than it actually possesses. The truth is that it is objective only in so far as it leads to a measure of a number of units. However, raising questions as to its own reliability or validity (a criterion itself ought to have a criterion) indicates that it, too, can be subject to a variety of vagaries, similar in some respects to the difficulties of ratings.

### EMPLOYEE RELATIONS INDEX AS A CRITERION

Another category into which criteria fall has been characterized as employee behavioral manifestations. The lead in systematic and comprehensive work in this area has been taken by Merrihue and Katzell (5) in a research project conducted at the General Electric Company. They have proposed the Employee Relation Index or ERI. It is intended to serve as a barometer of the climate of employee relations.

Conferences with management of the company, experiences, and research reported in the literature led to the view that an index might be constructed from measures of such employee behavior as absences, separations, participation in voluntary benefit plans, visits to the dispensary, suggestions submitted through suggestion system, actions incurring disciplinary suspensions, grievances, work stoppages, lost-time accidents, etc.

This research was not primarily concerned with absenteeism or turnover or any of the other factors in and of themselves. The view was that a group of such measures might collectively be manifestations or symptoms of a more fundamental and general condition. The theory was that if certain employee behavior could be identified and measured as a general substrate, then it could yield information on the reflections of employee attitude or performance. An index compounded from such measures might thus reflect employee motivation and therefore be indicative of other aspects of employee performance which depend upon motivation.

Thirty-three specific measurements of employee behavior were defined. Data were collected on employees paid by the hour in six different General Electric plants representing a wide variety of products, processes, and geographic locations. In all, 333 work groups were included; a work group was defined as consisting of the hourly employees reporting to a first line foreman on a given shift. Correlations among the 33 measures were computed for the 333 work groups, and a factor analysis was con-

ducted to analyze these intercorrelations. Since correlations were found, it led to the belief that a substantial proportion of each of these behaviors is a reflection of a single underlying cause. Even though these correlations are low, they are impressive when one considers all the other circumstances that may produce differences among work groups in these respects. For example, absenteeism may be due to illness as well as to a desire of an employee to escape from the job. A visit to the dispensary may be required to treat an injury, or it may be a chance to avoid work. A suggestion by an employee may be motivated to improve generally the company's welfare, or it may hope to eliminate a particularly personal unsatisfactory situation.

Eight measures were found which, statistically speaking, did almost as good a job of representing the general factor as did all 33 measures taken together. These eight measures were:

1. Participation in insurance plan.
2. Number of periods of absence.
3. Number of disciplinary layoffs.
4. Number of separations.
5. Number of initial dispensary visits (occupational).
6. Number of work stoppages.
7. Number of grievances.
8. Number of suggestions.

Using the statistical technique of multiple-regression equations, a formula was developed which is essentially the sum of the eight indicators, each weighted in such a fashion that the sum represents the best measure of their common source. The weighted sum is the ERI, for any work group. The data for each indicator were then studied to determine how many weeks of data needed to be accumulated to get a reasonably stable work-group score for that indicator. It was found that 26 weeks of data were needed to give satisfactory stability for disciplinary suspensions, grievances, and work stoppages. The other five indicators, which occur with greater frequency, are sufficiently stable when 13 weeks of data are accumulated.

All of this research was regarded as the pilot study. The question of paramount importance was whether ERI would work with another sample. To check, a sample of 15 different General Electric plants was enlisted to supply data. Further analyses produced results that were substantially consistent with those obtained in the pilot study. This con-

sistency indicated two very important things: (1) the original results had not reflected chance circumstances, and (2) the results were applicable throughout the company.

A further investigation was made of the relation existing between ERI and a variety of employee-background characteristics. The characteristics averaged for each work group were:

Average hourly rate.
Work shift.
Average length of service.
Size of work group.
Average age.
Average number of dependents.
Average number past separations.
Proportion of sexes.
Typical compensation methods (e.g. day work, group incentive).
Proportion of employees authorizing union check-off.
Average number past accidents.

None of these background characteristics were found to exert a particularly strong influence on ERI, although several, including size of group and length of service, were appreciably correlated with it.

An extension of this technique was applied to white-collar clerical salaried employees. Four of the original eight indicators, plus a new one —tardiness—were similarly found to form an ERI. The four indicators that were not relevant were work stoppages, grievances, disciplinary suspensions, and occupational dispensary visits. These were found not to be applicable since they do not occur among personnel of this type with sufficient degree of regularity.

The ERI is a measure of what employees actually do while they are on their job. The data are easily and routinely collectable. According to the researchers, this technique is potentially useful as a gauge to evaluate the effects of policies, procedures, and conditions on employee motivation and performance. Its fluctuations from period to period can indicate direction and extent of change. It can become a yardstick to complement other measures of organizational performance such as production, profit, etc. In these ways, it can help to improve the process of management.

Reference to this research has been made to point to a way that can avoid the dilemma of the criterion. This research represents a wholesome departure. In the opinion of this writer, it is worthy of careful study and wide application. If further research continues to substantiate its original promise, then in its setting, it would be instrumental in serving as a kaleidoscope, except that the pattern of the loose pieces could be permanently set.

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# TEST APPENDIX •

# • Test Appendix

**VARIOUS** psychological tests are referred to throughout the text, but in order to maintain continuity there is little or no description of some of them. The following list of the more commonly known tests includes the author, a brief description, time, validity, reliability, and the book page on which they are mentioned. The validity and reliability coefficients are approximations and should be regarded as typical but not necessarily exact.

ACTIVITY VECTOR ANALYSIS TEST, by W. V. Clarke.

*Description.* A variety of a word association test allegedly measuring aggressiveness, sociability, emotional adjustment, social adaptability, total. Test usage is limited to those who take the author's course.

*Time.* About 10 minutes.

*Validity.* Not clearly established.

*Reliability.* + .62 to + .75 depending upon vector measured.

*Page.* 309.

BLUM SEWING MACHINE TEST, by M. L. Blum.

*Description.* Subject is required to trace on a line and between two lines with the needle of the sewing machine.

*Time.* 10 minutes.

*Validity.* Discriminates between highest and lowest quartile of employed operators.

*Reliability.* + .80.

*Page.* 282.

CANFIELD SALES KNOWLEDGE TEST, by Canfield.

No information in the literature to the best of the writer's knowledge.

*Pages.* 558, 559.

FINGER DEXTERITY TEST, by J. O'Connor.

*Description.* Measures fine finger movements. Using only one hand, the subject is required to place three pins in each of 100 holes on a plate.

*Time.* 15 minutes.

*Validity.* None reported; some occupational differentiation.

*Reliability.* + .90.
*Pages.* 101, 169, 170, 295, 298, 387, 396.

General Aptitude Test Battery, by U.S. Employment Service.
*Description.* A battery of 12 tests measuring nine aptitudes, such as intelligence, form perception, manual dexterity, spatial ability, etc.
*Time.* 135 minutes.
*Validity.* Validation on samples of workers employed in various occupations.
*Reliability.* Generally in the + .80's.
*Page.* 310.

Guilford-Martin Personnel Inventory, by J. P. Guilford and H. G. Martin.
*Description.* A questionnaire measuring three traits: coöperativeness-fault-finding, objectivity-personal reference, agreeableness-belligerence. Questions similar to those on the usual inventory tests.
*Time.* 20 minutes.
*Validity.* Industrial validation differentiating groups of employees.
*Reliability.* + .85.
*Page.* 308.

Industrial Classification Training Test, by C. H. Lawshe and A. C. Montoux.
*Description.* Problems involving fundamental mathematical operations presented by means of several working drawings of material appropriate for industrial students.
*Time.* About 30 minutes.
*Validity.* + .71 with grades in an electricians' training course.
*Reliability.* + .73 to + .94.
*Page.* 306.

Johnson Temperament Analysis, by R. W. Johnson.
*Description.* An inventory yielding nine scores on such temperament traits as cordial-cold, depressed-cheery, critical-appreciative, etc.
*Time.* 45 minutes.
*Validity.* Not clearly reported.
*Reliability.* Range from + .57 to + .78.
*Page.* 472.

Kimberly-Clark Packing and Inspecting Test, by C. E. Jurgensen.
*Description.* Subject required to sort blocks and pack them into a compartment. This test, developed in industry, is easily transportable and relatively standardized from trial to trial.
*Time.* 20 minutes.
*Validity.* + .60.
*Reliability.* Low.
*Page.* 297.

MacQuarrie Test for Mechanical Ability, by T. W. MacQuarrie.

*Description.* A pencil and paper test, with seven subtests. Measures tracing, tapping, dotting, copying, tridimensional block counting, space perception, visual tracing.

*Time.* About 30 minutes.

*Validity.* Correlation with ratings, about + .50.

*Reliability.* + .90.

*Page.* 306.

Mechanical Aptitude Test, by L. J. O'Rourke.

*Description.* A pencil and paper test measuring information concerning tools and mechanical processes.

*Time.* 30 minutes.

*Validity.* + .64 to + .84 with shop ratings.

*Reliability.* Not reported.

*Page.* 306.

Mechanical Comprehension, by G. K. Bennett.

*Description.* Sixty pictorial problems relating to understanding the principles of physics involving mechanics.

*Time.* About 30 minutes.

*Validity.* Coefficients with occupation, + .30 to + .60.

*Reliability.* + .90.

*Page.* 306.

Minnesota Mechanical Assembly Test, by D. G. Paterson and others.

*Description.* The subject is to assemble from its parts, without instructions, each of a series of such common objects as monkey wrench, bicycle bell, links of chain, hose clamp, etc.

*Time.* About 20 minutes.

*Validity.* Correlation of + .55 with shop output quality.

*Reliability.* + .90.

*Page.* 339.

Minnesota Multiphasic Personality Inventory, by S. R. Hathaway and J. C. McKinley.

*Description.* An inventory consisting of 550 items which the subject indicates as being true or false. Such personality structures as hypochondriasis, masculinity-femininity, hysteria, hypomania, etc., are measured.

*Time.* 60 minutes.

*Validity.* Face validity reported.

*Reliability.* Separate scores range from + .71 to + .83.

*Page.* 472.

Minnesota Rate of Manipulation Test, by W. A. Zeigler.

*Description.* A board with 60 round holes and 60 round blocks. The placing test requires the subject to put each block into a hole. The turning test requires him to turn over each block in its hole, using two hands.

*Time.* About 15 minutes.
*Validity.* None reported; some occupational differentiation.
*Reliability.* + .90.
*Pages.* 295, 305.

MINNESOTA SPATIAL RELATIONS TEST, by D. G. Paterson and others.
*Description.* A measure of two-dimensional spatial relations on the performance level. The test consists of 58 odd-shaped and different-sized blocks that fit into appropriate spaces on a board. Four boards comprise the test.
*Time.* 20 minutes.
*Validity.* + .50.
*Reliability.* + .80.
*Pages.* 170, 339.

MINNESOTA VOCATIONAL TEST FOR CLERICAL WORKERS, by D. M. Andrew and D. G. Paterson.
*Description.* A name-checking and number-checking test that emphasizes speed and attention to minute detail.
*Time.* 15 minutes.
*Validity.* + .37 to + .65.
*Reliability.* + .90.
*Pages.* 279, 305.

MOVING-ROAD-SCENE DRIVER TEST, by H. De Silva.
*Description.* Subject presented with reasonable reproduction of driving on the road. Test measures general motor aptitude, particularly coördination; speed of reaction, and ability to do several things at once.
*Time.* 10 minutes.
*Validity.* None reported.
*Reliability.* None reported.
*Page.* 461.

OTIS SELF-ADMINISTERING TEST, by A. S. Otis.
*Description.* A measure of general intelligence. The 75 items include arithmetic, vocabulary, reasoning, etc. Easy to administer and to score.
*Time.* 20 minutes.
*Validity.* Indirect evidence that it measures intelligence.
*Reliability.* + .90.
*Pages.* 214, 286, 305, 306, 472, 558.

PERSONALITY INVENTORY, by R. G. Bernreuter.
*Description.* Questionnaire type of test that measures six personality traits: neurotic tendency, self-sufficiency, introversion-extroversion, dominance-submission, self-confidence, sociability.
*Time.* 20 minutes.
*Validity.* + .90 with other tests.

*Reliability.* + .90.
*Pages.* 471, 557.

PERSONNEL TEST, by E. F. Wonderlic.
*Description.* A brief test containing 50 questions that measure arithmetic problem solving, vocabulary, reasoning, and similar items included in pencil and paper tests of intelligence. Really a refinement of the Otis Self-Administering Test.
*Time.* 12 minutes.
*Validity.* + .85 with Otis Self-Administering Test.
*Reliability.* + .90.
*Page.* 286.

PREFERENCE RECORD, by G. F. Kuder.
*Description.* Over 300 paired comparison items, arranged and scored to give a profile of preference scores with respect to scientific, computational, musical, artistic, literary, social service, and persuasive activities.
*Time.* 40 minutes.
*Validity.* Correlated with adults' statement of interest to extent of + .75.
*Reliability.* + .90.
*Page.* 472.

PURDUE PEGBOARD, by Purdue Research Foundation.
*Description.* A test of manipulative dexterity designed to assist in the selection of employees in certain routine manual jobs. It provides separate measures for right hand, left hand, and both hands, and considers finger tip as well as more gross movements.
*Time.* 10 minutes.
*Validity.* Varies according to criterion group. In the neighborhood of + .40.
*Reliability.* + .86.
*Page.* 295.

REVISED MINNESOTA PAPER FORM BOARD, by R. Likert and W. H. Quosha.
*Description.* Geometric figures and five possible solutions presented to the subject, who is to choose the parts that constitute the figure. A measure of spatial relations of a two-dimensional character involving imagination rather than actual manipulation.
*Time.* 20 minutes.
*Validity.* None reported; some occupational differentiation.
*Reliability.* + .90.
*Pages.* 304, 306.

RORSCHACH PERSONALITY DIAGNOSIS, by H. Rorschach.
*Description.* A projective technique test which requires the subject to report what he sees in a series of standardized ink blots. Examiners must be trained in the scoring techniques and experienced in clinical practice.
*Time.* 40 minutes.

*Validity.* High, on basis of clinical diagnosis.
*Reliability.* Approximately + .80.
*Pages.* 145, 287, 471.

ROSENZWEIG PICTURE-FRUSTRATION STUDY, by Saul Rosenzweig.
*Description.* Twenty-four crudely drawn cartoons involve two people. The subject is expected to fill in the balloon with the reply to the other person's comment. The responses are scored for different varieties of aggression (a projective type test).
*Time.* 15 minutes.
*Validity.* Clinical basis but no statistics reported.
*Reliability.* Probably about + .70.
*Page.* 471.

SOCIAL INTELLIGENCE TEST, by F. A. Moss and others.
*Description.* A pencil and paper test that attempts to measure differences in ability to respond to social situations; questions are given orally to the subject. People with general intelligence may answer correctly, even though they have no knowledge of correct behavior in such situations.
*Time.* 40 minutes.
*Validity.* No satisfactory evidence.
*Reliability.* Not reported.
*Page.* 558.

SPECIFIC INTEREST INVENTORY, by P. P. Brainard and F. G. Stewart.
*Description.* Twenty groups containing five items each, designed to measure interest in such activities as physical work, vocal expression, etc.
*Time.* 30 minutes.
*Validity.* No clear report.
*Reliability.* + .68.
*Page.* 154.

TEMPERAMENT SCALE, by D. G. Humm and G. W. Wadsworth.
*Description.* A questionnaire yielding a profile score on seven "components of temperament": normal, hysteroid, manic cycloid, depressive cycloid, autistic cycloid, paranoid schizoid, and epileptoid.
*Time.* 30 minutes.
*Validity.* High validation claimed on basis of psychiatric diagnosis.
*Reliability.* + .85.
*Page.* 307.

THEMATIC APPERCEPTION TEST, by H. A. Murray.
*Description.* A series of pictures is presented to the subject, who is to use his imagination in making up a story about each picture. A projective technique requiring trained and experienced examiners.
*Time.* 60 minutes.
*Validity.* High, on basis of clinical diagnosis.

*Reliability.* Approximately + .80.
*Page.* 287.

TWEEZER DEXTERITY, by J. O'Connor.
*Description.* The subject, using tweezers, is required to pick up and place a pin in each of 100 holes.
*Time.* 10 minutes.
*Validity.* None reported; some occupational differentiation.
*Reliability.* + .70.
*Pages.* 295, 298.

TWO-HAND COÖRDINATION TEST, by E. J. Benge.
*Description.* The subject thrusts rods which he holds in two hands into two holes of the same diameter and then into two holes of smaller diameter. Correct thrusts are totaled by a mechanical counter.
*Time.* 5 minutes.
*Validity.* Questionable.
*Reliability.* Not too high.
*Page.* 286.

VOCATIONAL INTEREST BLANK, by E. K. Strong.
*Description.* The subject checks his attitude on an inventory of 400 items. Scoring is based on keys for over 30 occupations. Test assumes that interest and ability are highly related and that people in specific occupations have corresponding interests.
*Time.* About 40 minutes.
*Validity.* Scoring keys based on statistical analysis of likes and dislikes of people in specific professions.
*Reliability.* + .88.
*Page.* 558.

WASHBURNE SOCIAL ADJUSTMENT INVENTORY, by John N. Washburne.
*Description.* An inventory type yielding nine scores such as happiness, purpose, alienation, etc. It contains 122 items of the obvious (readily fakeable?) variety.
*Time.* 40 minutes.
*Validity.* The author reports a biserial coefficient of correlation of + .90. (This is unusually high for this type of test and deserves scrutiny.)
*Reliability.* + .92.
*Page.* 558.

WECHSLER-BELLEVUE INTELLIGENCE SCALE, by D. Wechsler.
*Description.* An individual intelligence test whose material is more suitable for adults than the Binet. Subtests include arithmetical reasoning, memory span for digits, picture arrangement, picture completion, etc.
*Time.* 60 minutes.
*Validity.* + .82.

*Reliability*. + .90.
*Page*. 287.

## MEASURING INSTRUMENTS

In addition to tests, certain specific measuring instruments have been mentioned. Because of the possibility of applying them to other situations as well as using them for further research they have been fully presented. These instruments appear as follows:

# INDEXES •

# • Index of Companies, Institutions, and Government Departments

# Index of Names

## Index of Names

# • Index of Subjects